

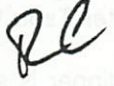
JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-440

8 January 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Utilization Team Minutes for 8 January 1990

PRESENT: Rob Staehle, Randy Cassingham, Lori Paul, Sima Lisman, Richard Grumm, Hershal Fitzhugh, Bing Chen, Paul Henry

Next Meeting: 15 January 1990 at 10:30 in 301-271

Rob Staehle

Happy new year to all, and welcome back.

A special Happy New Year message from Reston: progress has been made on the new PE&A charter. More detailed information should be forthcoming at the January 22nd Director's Review and Discussion meeting.

WPAs and SRMs are late from several task managers for PE&A tasks. Please hasten to complete them.

Steve Cook/ST notes that Codes S and E are arguing over a recent change in the location of the life sciences centrifuge. Code ST funding will not be released until this issue is resolved. At that time, the funding will likely come out of LaRC; we should work with Brian Pritchard/LaRC so it can move quickly once released.

Mike Devirian sent Rob a copy of a very good document on information systems and data downlinking, *System Telemetry Utilization Concept (STUC)*, from the Space Station Freedom Systems Division. While not yet baselined, Rob says the concept makes a lot of sense, and it has a good description of the data flow from the Station to users. It shows four terminal data distribution points from the TDRSS terminal at White Sands: JSC, MSFC, GSFC and JPL.

Per the recent Code S *Station Break* newsletter, the first pieces of the Data Management System's prototype hardware and software have been delivered to JSC by Boeing.

Tom Handley is attending the Increment Operations Design Panel meeting today and tomorrow in Houston. After that, Tom will be heading to Reston for a January 12th meeting on the End-to-End Communications System (EECS -- formerly the EEIS, the End-to-End Information System). Chuck Ivie will also be attending the latter meeting.

At the OAST Technology for Space Station Evolution workshop in Dallas January 16-19, Richard Masline will present a paper titled "High Rate Science Data Handling on Space Station Freedom", co-authored with Tom Handley, Chuck Ivie and Pam Stewart. This paper has also been submitted for journal publication.

There will be a meeting at MSFC January 29-30 regarding EMC Compatibility Model development. Andy Beck or a designee should attend.

A document for GSFC from McDonnell Douglas, *An Analysis of Space Station Freedom External Environmental Requirements*, was released in November. Apparently, this is the first major

effort to compile external environmental requirements from many scattered and poorly organized sources. The report cites several problems with respect to lighting and light scattering, molecular erosion, and particulate matter. Little concern was expressed over electromagnetic interference or electrostatic discharge issues. Rob has a copy of the document.

Mark Sistilli/EM announced that the first Attached Payload Investigators Workshop will be held at BDM in Columbus MD April 3-5. Bob Rhome/E directed that only flight project -- not concept study -- investigators should attend. Hershal Fitzhugh will attend, and may present the recently completed Payload Classification document. Peter Tsou will presumably also attend.

Ray Heacock will be retiring shortly. A farewell dinner is scheduled for February 1.

New "style guidelines" have been issued to reflect the current HQ-desired wishes on how to refer to the station (mainly capitalization). In some areas, the guidelines conflict with earlier directives (for instance, the reference to "station" in the first sentence of this paragraph would now be *wrong*). The guideline states, in essence:

- "Space Station Freedom" refers to the entire complex -- the manned base, including the international elements, *the two polar platforms*, and the Man-Tended Free Flyer [this is apparently the proper way to spell out MTFF...]
- "Space Station Freedom" should be used as the first reference. In later references, "Freedom", "Freedom Station" and "S.S. Freedom" can be used. [Note that "Station" and "Space Station" are now *always capitalized*, apparently because Truly likes it better that way. Same with "Space Shuttle".]
- "Program" can be capitalized or not.
- "Freedom" is *not* used with "Office of Space Station" or "Associate Administration for Space Station". [According to the Space Station Public Information Officer, this is because OSS and the AA might conceivably have cognizance over more than one space station, some day.] "Freedom" is used with "Space Station Freedom Program Office", "Director, Space Station Freedom" and "Space Station Freedom Program" (note that "Program" should be capitalized if you plan to use the SSFP acronym).
- The following should not be used: "SSF", "SS Freedom" (needs periods on "S.S."), or "Freedom" alone.

The guideline did *not* mention the use of *italics* when referring to Space Station *Freedom*; many style guideline reference books state that the names of ships and spacecraft should be italicized. Personal preference and the capability of your printer should be your guide. If you have any questions regarding any of this, do not contact Rob Staehle or Randy Cassingham.

Richard Kohrs has approved the following (verbatim) Mission Statement for Space Station *Freedom*:

The Mission of the Space Station Freedom program is to develop and operate a multipurpose Earth-orbiting facility beginning in the 1990's that will be the next critical step in establishing the United States as the preeminent spacefaring nation in the 21st century. The Space Station Freedom Program shall accomplish the following objectives:

- provide for permanent human presence in space;
- provide for long-term operation and utilization of facilities for scientific research and technology development that are enabled or enhanced by the presence of humans in space;

- stimulate the development of important technologies, such as automation and robotics, and otherwise support future U.S. competitiveness in technology;
- foster the development and demonstration of commercial products and processes;
- provide for servicing and rehabilitation of satellites and space vehicles;
- make an enabling contribution to the U.S. solar system exploration objective of returning humans to the Moon and then going on to Mars; and
- provide platforms to continuously study the Earth to help mankind understand its environment.

In achieving these objectives, the Space Station Freedom program will ensure that:

- a high degree of safety is maintained;
- international cooperation is strongly promoted in designing, developing, and operating Space Station Freedom;
- private sector participation is strongly promoted, including design, financing, and construction to the greatest extent feasible;
- the basic design of the Station allows for evolution as such factors as technology, techniques and operation philosophy mature over time;
- there is a strong awareness in the program of the necessity to involve and serve the users of Space Station Freedom;
- cost-effectiveness is an important factor in making management decisions; and
- benefits received are commensurate with U.S. investment in the program.

Lori Paul is back working on Space Station tasks part time after her accident last year. She will be organizing a Space Station library in building 601.

Sima Lisman

Sima demonstrated her Disturbance Simulation and Management Tool (née the Disturbance Modelling Tool) in Reston after the UDAWG (User Design Accommodations Working Group) meeting three weeks ago. The attendance was smaller than hoped -- although the UDAWG attendees were all sent invitations, the demonstration was not actually announced at the UDAWG meeting. No Code E NASA people attended, though Judee Robey (from EN/Bionetics) was quite interested, and is setting up another demonstration at Headquarters for February 7-8. SE&A people were also quite interested in the Tool. A video conference with other Centers may be set up to gather requirements.

Bob Laskin will be assisting with "marketing" the DSMT to potential users and sponsors beyond PE&A.

Dick Grumm

Dick, who has found Sima's model quite useful, feels that another D.C.-area demonstration would not be as effective as having a meeting here for the "troops" from LeRC and MSFC working under Code EN sponsorship. Perhaps our warm weather could entice a good attendance... Dick will suggest that working-level attendees promote the DSMT with their management. Fitz will suggest other possible users outside the Code EN "sphere".

The January 17-19 Containerless Processing workshop (in Pasadena) is shaping up to be a pure science workshop centering on the upcoming Spacelab mission. This would be an interesting meeting for anyone who is interested in the scientific aspects of containerless processing. Much less attention will be given to Space Station than originally intended because of the uncertainty over its real capabilities and the more immediate nature of Spacelab.

There was a lengthy discussion in the meeting about the importance of payload developers getting concrete, detailed, planned Space Station resource levels. Most information so far is not detailed or concrete enough for payload planning, or even science selection, to begin. Dick is sure that good science can be done no matter what the levels of resources are, but the levels have to be known before payloads are designed. Science users need higher fidelity, reliable "design to" information before putting much more effort into their utilization plans and payloads.

Hershal Fitzhugh

Fitz is still working with Kristan Lattu on Bob Rhome's request on expanding the scope of the Payload Life Extension document. The output will be some kind of cost/risk plan. Fitz hopes to meet with JPL reliability people this week to discuss their input to the work. Tom Gindorf/521 has expressed concern over the lack of input from his section.

Fitz has received three interesting documents: *Interface Design Considerations for Serviceable Satellites* and *Interface Design Considerations for Robotic Satellite Servicers* (both dated November 1989, both from the Satellite Service Systems Working Group), and *Design Guidelines for Robotic Serviceable Instruments* (dated August 1989, by Fairchild). Anyone interested in copies should contact Fitz.

Fitz noted that much work is proceeding at MSFC in adapting Spacelab hardware for Space Station. He also noted that Bob Rhome's/E presence at the last Science Utilization Management Director's Review (SUMDR) was quite prominent, elevating attention paid to SUM by OSSA's "front office" beyond the traditional role of Bob Benson/EM as chair.

Paul Henry

The Mars/Earth entry conditions task has nearly exhausted its budget, but analysis is essentially complete. The task has been led by Jayant Sharma with assistance from Phil Knocke and Ramona Vaughn, all of 312. The report is due at the end of February. Paul expects to be able to meet this date. Some work has been completed beyond the original scope of the task which will benefit the sponsor (Code ST). This includes consideration of the V_{∞} effects of Venus flybys, and extra free-return analysis available from another task performed by Aron Wolf.

The Mars trajectory video's script should be completed this week, and a narrator has been chosen. Paul hopes to have the video completed for the evolution symposium at JSC next month. It will probably be done; at minimum, the video's critical segments will be ready for showing then. Because of a strict 20 minute limit for presentations at the symposium, it may not be possible to present work completed since November, except for the video.

Work is progressing on the Stand-alone kit work for Mike Devirian. This kit would permit accommodation of small instruments at various locations on the Station structure without requiring access to all Station resources, especially power. Leigh Rosenberg and Dick Levin are assisting here. Paul recently got some good information on Ni-H batteries for LEO applications. There is not good statistical thermal testing data for the frequent charge/discharge cycles in LEO. Paul expects to make a presentation in late January to Reston.

Paul attended the UDAWG meeting last month with Sima and Fitz. Parts of the meeting, at least, were very good, the Boeing presentation on the pressurized modules, for instance. Paul has copies of all the presentations. Paul and Fitz talked with UDAWG chairman Bill Ramage/MSFC about JPL getting an official, voting member on the UDAWG panel. This is apparently still unresolved. Dave Hixon/PE&A would be the designated voting representative. Pasadena representatives will continue to be welcome in a non-voting capacity.

Fitz noted that power was an issue at the UDAWG meeting. In the past, plans called for the Station to have 75 kw of total power at the end of three years. However, this figure is a beginning-of-life figure; after three years, the solar panels will have degraded enough that the average power output will be only 65 kw. Structures was another issue discussed. A study looked at bringing all resources and utilities to all racks for pressurized payloads and, indeed, making all racks interchangeable. Apparently, however, there isn't enough room behind the racks to run all utility connections behind all of them. There is a movement to make all racks the same size (current designs call for slightly different rack sizes in the U.S., ESA and NASDA modules) -- 80 inches -- and the modules within the racks to be the same. Other tidbits from the UDAWG meeting:

- the U.S. Lab module has been moved to the port side of the Station because of assembly problems
- 50 kw is currently allocated to the Lab modules -- racks get 64% of the total, systems 36%
- the current microgravity specification likely will not be met on a full-time basis -- talk of "quiet time periods" is starting
- Planned EVA levels are: 15 two-person EVAs per year, maximum six hours/day/crewperson. STS suits will be used.
- The Global Positioning System won't be operational on the Station until Assembly Complete.

Leigh Rosenberg

Dick Levin or Leigh, at Allan Webb's request, will be attending a telecom on January 10th regarding teleoperations latency. They will be answering questions regarding work completed in September.

Upcoming Meetings

January 12: EECS Meeting in Reston. Tom Handley and Chuck Ivie to attend.

January 16-19: OAST Technology for Space Station Evolution workshop in Dallas. Jeff H. Smith to chair Robotics portion; Richard Masline to present.

January 17-19: Containerless Processing Workshop at the Pasadena Hilton. Richard Grumm to attend.

January 29-30: EMC Compatibility Model development meeting at MSFC. Andy Beck or designee to attend.

February 6-8: Station Evolution Symposium at JSC. Paul Henry, Jeff H. Smith, Kent Volkmer, Wayne Zimmerman (HQ Detailee), Samad Hayati and Rob Staehle to attend.

February TBD: User Integration Panel meeting in Reston. Rob Staehle to attend.

April 3-5: Attached Payload Investigators workshop at BDM in Columbus MD. Hershal Fitzhugh, Peter Tsou and Rob Staehle to attend.

May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

Recent Space Station-related Items from Code L's "Daily News in Brief" (Typos not corrected...)

SPACE DAILY, DEC. 13

"JAPAN FIRM BUYS SOVIET MIR BACKUP SPACE STATION"

"A Japanese trading company, the Horie Group, has bought a space station from the Soviet Union for \$10 million, according to the Kyodo News Service."

SPACE DAILY says the Horie Group, a private trading firm specializing in the space industry, reportedly bought the backup to the Mir space station and an accompanying Kvant experimental science module on Monday.

The story says the Horie Group intends to make the space station available to the Japanese space industry to promote space-related research, but it has no immediate plans to launch the craft.

SPACE BUSINESS NEWS, DEC. 25

"BOEING TO SPACE COUNCIL: DUMP SHUTTLE"

"Stop trying to improve existing launch vehicles and focus on developing new manned and unmanned vehicles, say Boeing engineers to White House Space Council."

SPACE BUSINESS NEWS reports in a study of transportation options for manned exploration of the moon and Mars, Boeing found that using new launch vehicles rather than improved current models would save more than \$150 billion over the next three decades.

The paper reports Dan Gregory, an official in the company's space transportation product development office, presented Boeing's findings to the National Space Council staff and its "blue ribbon" advisory panel recently.

SBN reports Boeing officials declined to comment on the proposal. But a copy of the presentation Space Business News obtained shows Boeing would phase out both the Shuttle and Titan launch vehicles by 2001 in favor of better boosters.

AEROSPACE DAILY, DEC. 28

"FRANCE TO PAY SOVIETS \$12 MILLION FOR TWO WEEK STAY ON MIR"

"A French cosmonaut will spend two weeks in space conducting research on Mir in the second half of 1992 under an agreement signed Dec. 23 by representatives of the French space agency CNES and the Soviet space agency Glavkosmos, a CNES spokesman said yesterday."

The DAILY reports France will pay \$12 million, which will include 12 full days of research on Mir involving 13 experiments being developed by CNES. French cosmonaut Jean Luc Chretien has flown twice on Mir, but the French government didn't have to pay because it agreed to share data and leave experiment apparatus with the Soviets.

The story reports CNES expects by June 8 to select eight cosmonaut candidates who will undergo medical tests in the Soviet Union. Michel Tognini, who was the backup on Chretien's two flights, will likely be one of the candidates. They will be selected from applicants with professional pilot experience and mission training will begin in September. The mission, named Antares, will include experiments on physiology, space biology and biotechnology.

UNITED PRESS INTERNATIONAL, JAN. 8 William Harwood

"Scientists don't know what to expect when an experiment-studded satellite loaded with high tech materials and 14 million seeds is plucked out of orbit by the crew of the shuttle Columbia this week after 5 1/2 years in space."

UPI reports they hope to gain insights into how long-term exposure to the space environment affects a variety of materials in research expected to help engineers design hardier spacecraft.

"Almost any type of material, any type of system that you can conceive for a spacecraft, is represented on here," said project scientists William Kinard. "We have something in excess of 10,000 test specimen."

UPI reports the 21,396 pound satellite--called the Long Duration Exposure Facility, or LDEF--was dropped off in orbit April 7, 1984, by the crew of the Shuttle Challenger. It is a project developed by NASA and built at the Langley Research Center. The 30 foot long cylindrical satellite houses 57 experiments.

The story reports the 12,200 pounds of experiments aboard LDEF were provided by scientists from the U.S., Canada and Europe. They are classified in four broad categories: materials, coatings and thermal systems; power and propulsion; basic science; and electronics and optics.

UPI lists a sampler of experiments aboard LDEF:

- * a variety of crystals were grown that should exhibit more structural perfection than is possible in Earth's gravity. The availability of such pure crystals could lead to technological advances in electronics and optics.
- * the effects of vacuum, atomic oxygen and space radiation on a variety of materials used in solar cells will be assessed to determine which should be used to build durable, lightweight solar arrays that could lengthen a satellite's useful lifetime.
- * astrophysicists are counting on an interstellar gas experiment to provide new insights into the galactic abundance and distribution of elements created in the cores of stars. The experiment was designed to trap isotopes generated outside the solar system.
- * researchers also hope to determine the effects of micrometeorites on a variety of materials. A separate experiment was designed to help researchers understand the chemistry of the projectiles in a study that could refine theories about how the solar system formed.
- * some 14 million seeds provided by the George W. Park Seed Co. of Greenwood, S.C., ranging from tomatoes to kudzu. The experiment was placed on board to study the long-term effects of the space environment on plant growth. The major portion of the study involves about 12 million tomato seeds sealed in five containers. The seeds will be shipped to classrooms across the nation in a project to spark renewed interest in science education.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

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Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	183-401	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	303-308	4-6092	BDHansen	BDHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	113-114	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
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Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	512-202	7-9130		
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LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
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Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
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Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	183-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
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JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-444

15 January 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Utilization Team Minutes for 15 January 1990

PRESENT: Rob Staehle, Randy Cassingham, Lori Paul, Bing Chen, Tom Handley, Sima Lisman, Paul Henry, Valerie Thomas

Next Meeting: 22 January 1990 at 10:30 in 301-271

Rob Staehle

Rob will be on vacation this Wednesday through Monday morning. There *will* be a meeting on Monday – Paul Henry will chair. While away, Rob plans to drop by Boeing in Seattle; contact Rob if you are interested in him picking up anything in particular from there. Dick Laeser will be at JPL to address the Director's Review and Discussion meeting here on Monday afternoon in 180-101.

Dick Laeser expects to make a guest appearance at next week's meeting to explain the latest developments in Reston.

Rob received two papers by Ivan Bekey/Z delivered to the International Astronautical Federation meeting last October in Spain: *A Smaller Scale Manned Mars Evolutionary Program* and *Shuttle-Z: A New Heavy Lift Launch Vehicle for Manned Lunar and Mars Missions*. Contact Rob if you are interested in copies.

McDonnell Douglas/KSC has delivered a report titled *Advanced Automation For In-Space Vehicle Processing*, reporting on a study directed by KSC's Space Station Office and Advanced Projects Directorate and the LaRC Space Station Evolutionary Definition Office. The task was coordinated with Jeff H. Smith's/311 A&R study effort. Lori Paul will have a copy in the Space Station library.

SRMs and WPAs are needed by January 26th for Code EM tasks from Hershal Fitzhugh (SUM Team Support), Valerie Thomas (SUM Classification Requirements), Kristan Lattu (SUM Document Evaluation), Wallace Tai (SUM Remote Instrument Operations) and Rob (Science Utilization Management).

PE&A has been asked to address the Advanced Technology Advisory Committee (ATAC) meeting on February 13-14 on the A&R Implementation Plan, and the applicability of SDTM to A&R application issues. PE&A will draw from Jeff L. Smith's SDTM task and from Jeff H. Smith's now-dormant A&R plan.

There is a very interesting report in the *ESA Journal* regarding ESA's Eureka platform's flight operations. It has some similarities to the SKP concept we studied earlier and the *Freedom* Polar-Orbiting Platform, and will accommodate microgravity, space physics and space technology payloads. Eureka is relatively autonomous; it can operate for 48 hours without any ground commands and has on-board fault isolation and correction, and on-board cooling systems. Data communications is via packet telemetry.

There will be a User Operations Working Group meeting February 26-27 in Fairfax VA. A User Integration Panel meeting will also be held there March 1-2.

Lori Paul

Lori is starting to put together the Space Station library in Building 601, room 244Q. If anyone has documents that they don't want in their office, but want to be kept available, they should send them to Lori at ms 601-237 (or shipped to her at 601-244Q).

Bing Chen

Bing has completed a report on his commonality study on the Drop Physics Module and the Microgravity Containerless Processing Facility, and how they will fit together with other payloads that other Centers are working on. The most significant finding is that some science proposed for the Station might not be suitable for the Station since they do not require the long duration the Station provides, but do require significant crew attention that is more available from Spacelab.

Tom Handley

Tom was in Reston last week, and reported on some possible changes coming to that organization (it was reported in last week's minutes that PE&A's charter is being revised). (To prevent restatement, other changes to PE&A's structure are expected to be reported by Dick Laeser at the next meeting.)

Tom was in Reston to discuss a new EECS (End-to-End Communications System) Architecture Description Document with Bob Vuolo and Andy Bennett. The contents was outlined, and the first draft (showing form and contents) is due March 1. There will be various versions reflecting various timeframes; Assembly Complete will be the first version. The document's concept is a "radical departure" from what's been done before - Tom notes that the program is in great need of the information the document will contain. It will offer differing views of the data management system - functional, logical, programmatic, etc. - so the details of the contents are still being worked on. More work is expected soon in this arena.

Sima Lisman

Sima or Bob Laskin will demonstrate their Disturbance Simulation and Management Tool there for the microgravity community at the ISET (Intercenter System Engineering Team) meeting at HQ February 9.

Paul Henry

The Stand-Alone Kit's concept design is pretty much complete; it should be solid by the end of the week and written up by the end of next week. Mike Devirian plans to show it to Code E and user accommodations people at Level II. ESA is also reportedly quite interested.

The Mars video is still on target for delivery on January 31. The narration is finished, and drawings are in progress. Paul expects the first sequence (a minute or so) will be ready for his review on Thursday.

Work with 312 on Mars mission trajectories is on hold until Code ST funding is straightened out. There is some very good work that has been done here, and it needs to be published. (Rob and Paul met after the meeting and decided the report would be completed with available funds. It already goes beyond the agreed scope, but some additional work beyond available funds would significantly enhance the final product.)

Paul is busily cutting from his viewgraphs to meet a 20 minute limit for presentations at the evolution symposium at JSC February 6-8.

Valerie Thomas

Three WPAs are in progress, two of which Valerie will fax to Rob tomorrow. Negotiations are still pending with Al Holt/SSU regarding funding and scope for a third task. Jerry Murphy is planning to attend the January 29-30 EMC Compatibility Model development meeting at MSFC, and will provide details of his participation this week.

Upcoming Meetings

January 16-19: OAST Technology for Space Station Evolution workshop in Dallas. Jeff H. Smith to chair Robotics portion; Richard Masline to present.

January 17-19: Containerless Processing Workshop at the Pasadena Hilton. Richard Grumm to attend.

January 29-30: EMC Compatibility Model development meeting at MSFC. Jerry Murphy to attend.

February 6-8: Station Evolution Symposium at JSC. Paul Henry, Jeff H. Smith, Kent Volkmer, Wayne Zimmerman (HQ Detailee), Samad Hayati and Rob Staehle to attend.

February 9: ISET (Intercenter System Engineering Team) meeting at HQ. Sima Lisman or Bob Laskin will demonstrate their Disturbance Simulation and Management Tool there for the microgravity community at the meeting.

February 26-27: User Operations Working Group meeting in Fairfax VA. Rob Staehle to attend.

March 1-2: User Integration Panel meeting in Fairfax VA. No one yet slated to attend.

March 20-23: Mission Management Director's Review/Science Utilization Management Director's Review (OSSA) meeting at KSC. Hershal Fitzhugh, Robert H. White and Rob Staehle to attend.

April 3-5: Attached Payload Investigators workshop at BDM in Columbus MD. Hershal Fitzhugh, Peter Tsou and Rob Staehle to attend.

May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

USA TODAY, JAN. 10

"SATELLITE VITAL TO PLANS FOR SPACE STATION" Paul Hoversten

"Pockmarked by debris and singed by the sun, a NASA science satellite will soon be home after a 5 1/2 year torture test in space."

USA says the Long Duration Exposure Facility "holds priceless information for the planners and architects of Space Station Freedom." Columbia flight director Al Pennington said, "It's just chock-full of every material we use in spacecraft. It's been sitting up there being bombarded by the things that come in from outer space. Learning what space is all about and how to survive a long duration like we're going to have to do with the Space Station makes this an extremely important retrieval."

USA says the satellite will give NASA a better idea about how to protect the planned Station over its 30 year lifespan, and guard the astronauts who will live and work there. Scientists expect LDEF's biggest contribution to the Station will be in finding out how much shielding to add, based on the amount of natural and man-made space debris it encountered.

Space Station Utilization Team Weekly Meeting Minutes
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Colavita, Mark	385	169-214	4-7835		
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Deshpande, Govind	311	601-237	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	183-401	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	303-308	4-6092	BDHansen	BDHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	113-114	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	512-202	7-9130		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	

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Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
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Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
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Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
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Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	264-648	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
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Total: 99 (82 paper, 17 NASAmail) * Printed 16 January 1990


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-448

22 January 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Utilization Team Minutes for 22 January 1990

PRESENT: Paul Henry, Randy Cassingham, Richard Masline, Lori Paul, Richard Levin, Bing Chen, Richard Grumm, Chris Hartsough, Terry Scharton, Gerry Murphy, Hershal Fitzhugh, Sima Lisman, Bob Laskin

Next Meeting: 29 January 1990 at 10:30 in 301-271

Dick Laeser/PE&A was going to try to be at today's meeting to discuss PE&A's new role, but was unable to come. However, a new role statement has been agreed to between Dick and Robert Moorehead, deputy director, Program and Operations of the SSFPO. A name change for PE&A is possible, but the new name has not been decided yet. The new charter was presented at the afternoon Director's Review and Discussion. Those wishing more details may contact Rob Staehle or bring questions to next week's utilization team meeting.

Paul Henry

Quick reminder: SRMs and WPAs for several Code EM tasks need to be in Rob's hands by January 26th.

Section 311 is looking for a temporary assignee to go to Reston for four to six months beginning as soon as possible. The task is to work on Space Station Systems Engineering and Analysis. The appointment carries all the benefits of being an assignee. See Rich O'Toole (Section 311 manager, x4-1078) if interested.

There are several new meetings listed in the "Upcoming Meetings" section below. Of note, the UDAWG will be meeting just prior to the UIP meeting in Fairfax, VA, and the User Operations Working Group will be meeting at the same time in the same building.

Richard Masline

Dick attended the OAST Technology for Space Station Evolution workshop last week in Dallas and presented a paper titled "High Rate Science Data Handling on Space Station Freedom". The workshop was widely attended by NASA people; it was a good meeting.

Dick also attended the Operations Management System (OMS) Working Group meeting earlier, and notes that there is an impression that JPL has pushed the conversion to DC power on the Station through; the work is viewed poorly, especially by LeRC folks, and because of the way the power system is currently being designed (by Rocketdyne), there is a feeling that it won't work properly. Therefore, a movement to change the power system again is mounting. This was discussed in detail in today's meeting. Stan Krauthamer did some good work on reporting on available systems technology without necessarily advocating any particular path. It was suggested that Stan should come to a Monday meeting and help clear up the confusion in this arena. Dick said he would call Stan and let him know about the reported concerns, and see if he would like to come talk to us.

Lori Paul

The Space Station Library in Building 601, room 244Q is now "open". If anyone has Space Station documents that they don't want in their office, but want to be kept available, they should send them to Lori at ms 601-237 (or shipped to her at 601-244Q). Dick Masline noted we need to have *all* PDR documentation on hand so that we can write and review change requests. Apparently, no one on Lab now has a full set of this documentation. Lori will check to see what is involved in getting copies.

Richard Grumm

The Containerless Processing Workshop was held last week in Pasadena. As mentioned in earlier meetings, it centered on containerless science aspects, rather than on *where* the science would be done. Spacelab looks like a much more favorable location, though it does look like the Space Station will present opportunities. Paul asked about the feasibility of iterative experimentation over a few days' or weeks' time aboard the Station -- will science planning or resources be too constrained to permit this? Relatively rapid iteration should be a significant advantage of the Station over Spacelab, and Paul wanted to know if this was realistic in light of current planning.

Gerry Murphy/Terry Scharton

Gerry's task plan for Space Station Utilization is pretty well worked out; he expects that Cox will sign off on it tomorrow. Another task RTOP, for Code E, is in the works.

Gerry will be attending a meeting next week at MSFC to support EMC requirements for Space Station; they will be discussing modelling problems in hopes of tying it in with other modelling efforts.

Terry briefed the folks in Reston on his VAPEPS (Vibroacoustic Payload Environment Prediction System) work; he believes VAPEPS would be an ideal tool to manage disturbances from crew noise. Terry is proposing a workshop for Space Station personnel to demonstrate and teach use of the tool. Dick Grumm found this interesting, and expressed hope that the VAPEPS people are keeping in contact with Sima Lisman's effort with her Disturbance Simulation and Management Tool. They apparently are, indeed, keeping in touch, and are not overlapping their efforts. This led to a long discussion regarding the transmission of vibrations along the Station truss, and about whether thermal changes during orbit will cause deformations and/or vibration. Currently, the models assume no vibrational impact from the thermal changes.

Hershal Fitzhugh

Fitz received five Functional Control Documents (FCDs) to review: *Payload (Manned Base) Analytical Integration FCD*, *User Operations Integration FCD*, part of a training FCD, *Ground Processing FCD*, and *Integrated Logistics Support FCD*. Fitz was given 3-5 days to review them all; he did submit quite a few comments.

Bob Laskin/Sima Lisman

The funding levels for their task has been negotiated with Mike Devirian and the SRMs delivered to Rob.

Upcoming Meetings

January 29-30: EMC Compatibility Model development meeting at MSFC. Gerry Murphy to attend.
February 5-7: Payload Processing Working Group kickoff meeting at HQ. Hershal Fitzhugh to attend.
February 6-8: Station Evolution Symposium at JSC. Paul Henry, Jeff H. Smith, Kent Volkmer, Wayne Zimmerman (HQ Detailee), Samad Hayati and Rob Staehle to attend.
February 8-9: ISET (Intercenter System Engineering Team) meeting at HQ. Sima Lisman and Bob Laskin will demonstrate their Disturbance Simulation and Management Tool for the microgravity community at the meeting.
February 15: Science Utilization Management Team monthly videoconference on pressurized payloads. 2:30 pm in the ViTS room. Hershal Fitzhugh to attend.
February 21-22: OSSA Program Review meeting in Washington DC. Rob Staehle and Hershal Fitzhugh to attend.
February 26-27: User Operations Working Group meeting in Fairfax VA. Rob Staehle to attend.
February 26-27: UDAWG (User Design Accommodations Working Group) meeting in Fairfax VA. Hershal Fitzhugh and Paul Henry to attend.
March 1-2: User Integration Panel meeting in Fairfax VA. Rob Staehle and Hershal Fitzhugh to attend.
March 20-23: Mission Management Director's Review/Science Utilization Management Director's Review (OSSA) meeting at KSC. Hershal Fitzhugh, Robert H. White and Rob Staehle to attend.
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May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

AEROSPACE DAILY, JAN. 22
"SPACE POLICY/STATE OF THE UNION"

"Space policy and other interest groups are lobbying White House speech writers to put some sort of plug for the space program in President Bush's Jan. 31 State Of The Union address."

The DAILY reports a source familiar with the issue says the debate is whether to mention the Administration's commercial space efforts, the space exploration initiative, or both.

SPACE NEWS, JAN. 22
"TRULY REQUESTS TARGET DATE FOR LUNAR BASE: 2010" Andrew Lawler

"NASA Administrator Richard Truly asked Vice President Dan Quayle last Thursday to recommend that the president announce that the United States will return to the moon by 2010, according to administration sources."

SPACE NEWS reports Truly made the request at a White House National Space Council meeting, but all the other council members present, including the representatives of the departments of Defense, Commerce and Transportation, recommended against a target date.

The paper reports Quayle, who chairs the Space Council, did not make a decision at the meeting January 18. NASA officials said they are confident he will decide in their favor, and that President Bush will make the announcement, possibly during his state of the union address later this month, that the U.S. will return to the moon at the end of the next decade.

"Even those against it recognize there is a high probability it will happen," one high-ranking NASA official said.

SPACE NEWS reports the next Space Council meeting is scheduled for January 25. Members will discuss the role of international participation in the lunar and Mars initiative.

The story reports NASA explained its position on establishing a date in a document that outlined the pros and cons. A specific plan for returning to the moon must be nailed down 10 years before the landing, according to the NASA position.

The paper reports NASA said in the 1990s, the agency would examine technologies and alternative approaches, both its own and those of industry contractors. The specific design would not have to be chosen until the end of this decade. Opposition to establishing a date is based on concern that it would force the premature selection of a plan for setting up the base, according to administration sources.

AEROSPACE DAILY, JAN. 23

"COLUMBIA, LDEF PREPPED FOR TWO DAY FLIGHT BACK TO KSC"

"NASA technicians yesterday were preparing the Shuttle orbiter Columbia and the 11 ton Long Duration Exposure Facility in its payload bay for Thursday morning's start of a two day flight to Kennedy Space Center, where LDEF's experiments will be removed and inspected."

The DAILY reports the flight to KSC includes a refueling stop at Davis-Monthan AFB, Ariz., an overnight stay at Kelly AFB, Texas, and a second refueling stop at Eglin AFB, Florida.

The story reports LDEF will be removed from the payload bay at KSC for inspection by research teams around the end of the month. Removal of the 57 experiments will begin by mid-February.

AEROSPACE DAILY, JAN. 23

"SOVIETS HAD 74 LAUNCHES IN 1989"

"The Soviet Union led the world with 74 of the 101 space launches to orbit in 1989, compared to 18 for the U.S. and seven for Europe, a Western observer said last week. The only other country to record successful launches last year was Japan with two."

The DAILY reports Geoffrey Perry of the Kettering Group in England said the Soviet total was down from 90 in 1988, 95 in 1987 and 91 in 1986. He said the decline is due in part to the Soviets fielding longer-lived reconnaissance satellites, reducing the number of third-generation satellites that stay up an average of two months and fifth-generation satellites that operate for six months.

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JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-453

29 January 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Utilization Team Minutes for 29 January 1990

PRESENT: Rob Staehle, Randy Cassingham, Richard Masline, Paul Henry, Bing Chen, Richard Grumm, Sima Lisman, Hershal Fitzhugh, Kristan Lattu, Leigh Rosenberg, Lori Paul

Next Meeting: 5 February 1990 at 10:30 in 301-271

Rob Staehle

The Polar Platforms are now officially part of OSSA after being transferred from Code S by Dick Truly. [See "Daily News in Brief" item below.]

LDEF is back safe at KSC now. There are, so far, no surprises.

The Bush Administration has delivered its 1991 budget request to Congress. NASA's portion is \$15.2 Billion -- a 24% increase over 1990. The increase, which is the largest increase for any agency, is mainly for Space Station, STS operations, and Human Exploration Initiative. Rob expects that this number won't be accepted without some fighting in Congress.

JSC's New Initiatives Office has released an RFP for a satellite servicer system flight demonstration phase B contract. The demo will include automated rendezvous and docking, automated ORU exchange, and fluid transfer capabilities. Each may be of interest to Space Station tasks here.

Apparently, no one has yet to see the Code ST 90-1 POP call, though it has been referred to elsewhere. Lori Paul will try to track it down.

Terry Scharton travelled to Reston to discuss the use of the JPL Vibroacoustic Payload Environment Prediction System (VAPEPS) for Space Station vibroacoustic work. He talked with Keith Miller/SSS, Alan Lindenmoyer/SSS, Robert Liddle/Grumman, Joe Hale/MSFC, Doug Counter/MSFC, and Alan Sorensen/Tracor. All seemed interested in using VAPEPS. Terry is proposing a VAPEPS Workshop specifically for Space Station personnel, and hopes to make a pitch to the Loads and Dynamics Working Group Splinter Meeting on Noise Control at JSC on February 6. (After the meeting, Terry reported that McDonnell Douglas is close to deciding on what vibroacoustic tool to use in their work package contract.)

Richard Masline

Regarding the discussion from last week's meeting regarding JPL's role in the decision to switch to DC power on the Station: Dick talked with Stan Krauthamer, who did much of the work at JPL to study power system options, and was convinced that DC is indeed a viable option. Dick also spoke for some time with Mukund Gangal/PE&A, who seems to be on top of the problem. A memo from Mukund in response to the item on this subject in last week's minutes is attached.

PDRD documentation to support the upcoming software PRD has been sent out, but JPL was not on the distribution list for them. Dick and Hershal Fitzhugh will attempt to track copies down for us. This led to a long discussion over the current state of TMIS -- some documentation is

probably available *only* over TMIS. Lori Paul will check into the current state of TMIS at JPL and what hardware and software is needed to access documents on TMIS. It is possible, if not likely, that no special hardware will be required, and only perhaps a certain communications software package. TMIS requires special workstation terminals for advanced functions, but it was unclear if document downloading is considered an advanced function.

Paul Henry

Paul will be attending the Space Station Evolution Symposium next week; the video should be finished in time for its debut there. It is scheduled to be done by Wednesday afternoon.

The technical analysis phase of the stand-alone kit is complete. Leigh Rosenberg will be doing some costing analysis, and a physical model will be made.

Richard Grumm

Dick attended a review meeting at LeRC regarding the Fluid Dynamics Facility (FDF). An issue came up that it was unclear whether or not it was possible to make any changes to the Station configuration anymore, or whether it was too late. There is concern that the station will not be able to accommodate the FDF. No one at the review was sure whether or not the Station had any scientific objectives against which to base a change request. While they are serious about the concern, it may be a moot point: the FDF was "rephased" to a launch after the year 2000.

Dick received a memo from Code EN requesting input (by February 20) for their "planning for new initiatives/augmentations" in OSSA's strategic plan. Four key areas were identified for strengthening:

- Microgravity Fundamental Science and Advanced Technology Development Ground-Based Augmentation (to analytically and experimentally develop the basis for flight experiments).
- Microgravity Fundamental Science Flight Augmentation (to investigate a number of fundamental physical and chemical laws through access to the low-gravity environment. Involves a program of small-scale investigations which can use the Shuttle, small dedicated free-flyers, the Space Station, and, possibly, commercial platforms).
- Microgravity Alternate Flight Opportunities (a new initiative to take advantage of a variety of methods to obtain a reduced-gravity environment, such as the use of sounding rockets and free-flyers to complement current capabilities while minimizing program costs).
- Microgravity Science and Applications for the Human Exploration Initiative (details to be established).

Sima Lisman

Bob Laskin was approached by the User Design Accommodations Working Group (UDAWG) and asked to demonstrate the Disturbance Simulation and Management Tool at the next UDAWG meeting. Sima did a demonstration at the end of a recent UDAWG meeting, but the demo was not announced in the meeting, so few attended. The Tool will also be demonstrated at the February 8 Intercenter System Engineering Team meeting at HQ.

Leigh Rosenberg

Leigh is starting on some cost analysis work on the attached payload stand-alone kit for Paul Henry and Dick Levin.

GSFC has become interested in the FY89 EECS command latency task that Leigh, Dick Levin, Ken McGraw and Jerry Olivieri worked on. They spent some time with Leigh and Dick in a telecon, asking many questions on how the work was done. They apparently wish to carry the work further.

Lori Paul

There have been many donations to the Space Station Library -- thanks. Anyone who has topics that they are particularly interested in documentation on should contact Lori so she can look out for the topic. Because space is limited, information on some topics is being discarded where there is no apparent direct relationship to ongoing work in Pasadena.

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM
PE&A MG 90-018
January 29, 1990

TO: Randy Cassingham
FROM: Mukund Gangal
SUBJECT: Facts About dc Distribution

I was surprised to read in the minutes of your SS Utilization Team meeting about the corridor conversations and innuendos about the JPL work on power distribution and the "confusion" about it. Such confusion can be easily cleared up.

The dc decision was made at the NASA Associate Administrator level after a program-wide study. I am enclosing for the record the details of the dc distribution decision. I hope you include the full text of this memo in your next report, with the same distribution as your January 22, 1990 minutes.

1. BACKGROUND

The 1987 Electric Power System was baselined to use 20kHz technology for power distribution. MSFC, JSC, GSFC, ESA and NASDA were unhappy with that selection and wanted to consider an end-to-end dc system because of past spacecraft experience with 28-50V dc distribution. In addition there was a criticism in Aviation & Space Week about the wisdom of 20 kHz selection.

2. JPL STUDY (Mar. - Sep. 1988)

T. Moser, SSFPO Director, asked JPL to do an analysis comparing the 20kHz and 120V dc systems for secondary distribution.

JPL study concluded the following:

- Both systems can be built and would work
- The state-of-the-art (SOTA) of dc components was at a point where many components were developed to prototype stage and beyond
- Because the Space Station PV arrays and batteries work in the dc mode, even if ac distribution were to be used, a dc subsystem and components such as regulators, switchgear, charge/discharge controllers, etc. must be developed
- A low power 100V dc spacecraft has been built (components qualified)
- Submarines use 155V dc (>50kW); tank and aircraft systems are under development (270V dc)

- Industry has used 100V dc (>100kW) power distribution for many years
- Considering end-to-end efficiency, dc would be more efficient than 20kHz, although eventually (with experience), the 20kHz can approach the same level of efficiency as dc
- dc would be cheaper even after accounting for extra mass for dc cables
- Integration risk was lower with dc
- The JPL SOTA of dc systems report was published; LeRC reviewers' comments were rebutted giving specific test data and component specifications.

3. JPL RESULTS CONFIRMED (Sep.-Dec. 1988)

After the JPL input, a formal full scale study was commissioned by the SSFPO Director and was conducted by B. Cramer of SE&I Level II. The study confirmed the JPL conclusions. MSFC, JSC, GSFC, ESA, NASDA and Utilization concurred with the 120V dc position.

MSFC's contractor Boeing had also done an independent study which showed dc to be the best option technically and economically. We were not given the Boeing report to insure independence.

A similar study for the platform was conducted by GE independently of JPL. GE conclusions were in complete agreement with JPL's studies.

MSFC and JSC estimated that the use of dc secondary would result in \$150 million cost avoidance for each of them during system integration.

The SSFPO Director (Sisson, acting) made a decision in December 1988 to use a hybrid system, primary 20kHz and secondary 120V dc.

4. ALL DC DECISION

In FY '89, the Station budget was cut; NASA responded by a descoping effort under the direction of R. Hook. During this effort a decision was made by the Assoc. Administrator (Lenoir) and the SSFP Director (Kohrs) to go to the all dc design which they believed would yield a reduction of about \$100 million in cost after factoring cable mass increase. JPL was not involved in this decision.

Subsequently at a Congressional Committee hearing, the Assoc. Administrator stated that even if they had all the money, he still would have made the decision to go to dc distribution.

Some LeRC people have consistently opposed the dc decision and have been bitter about it. But they also admit that LeRC is equipped to design and build an excellent dc system. Naturally, as with any system of this magnitude (\$1.5 billion), problems will arise from time to time and will have to be solved, but that should not be viewed as something unusual.

5. SUMMARY

JPL did the initial study; our conclusions were verified independently by three organizations and were concurred with by MSFC, JSC, GSFC, ESA, NASDA and SSU (utilization).

The dc decision was made at the highest levels within the NASA SSFP organization; while they may have used our earlier study as an input the decision was certainly not based on that study.

At the OAST Technology for Space Station Evolution Workshop last week, Kohrs once again stated the \$100 million savings from the dc decision.

cc: R. Edelson
R. Easter
S. Krauthamer
R. Staehle

Upcoming Meetings

February 5-7: Payload Processing Working Group kickoff meeting at HQ. Hershal Fitzhugh to attend.

February 6-8: Station Evolution Symposium at JSC. Paul Henry, Jeff H. Smith, Kent Volkmer, Wayne Zimmerman (HQ Detailee), Samad Hayati and Rob Staehle to attend.

February 8-9: ISET (Intercenter System Engineering Team) meeting at HQ. Sima Lisman and Bob Laskin will demonstrate their Disturbance Simulation and Management Tool for the microgravity community at the meeting.

February 15: Science Utilization Management Team monthly videoconference on pressurized payloads. 2:30 pm in the ViTS room. Hershal Fitzhugh to attend.

February 21-22: OSSA Program Review meeting in Washington DC. Rob Staehle and Hershal Fitzhugh and Kristan Lattu to attend.

February 26-27: User Operations Working Group meeting in Fairfax VA. Rob Staehle to attend.

February 26-27: UDAWG (User Design Accommodations Working Group) meeting in Fairfax VA. Hershal Fitzhugh and Paul Henry to attend. Bob Laskin to demonstrate the Disturbance Simulation and Management Tool.

March 1-2: User Integration Panel meeting in Fairfax VA. Rob Staehle and Hershal Fitzhugh to attend.

March 20-23: Mission Management Director's Review/Science Utilization Management Director's Review (OSSA) meeting at KSC. Hershal Fitzhugh, Robert H. White and Rob Staehle to attend.

April 3-5: Attached Payload Investigators workshop at BDM in Columbus MD. Hershal Fitzhugh, Peter Tsou and Rob Staehle to attend.

May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

AEROSPACE DAILY, JAN. 24
"SOVIETS PLAN FIRST TESTS OF MANNED MANEUVERING UNIT"

"Cosmonauts Aleksandr Viktorenko and Aleksandr Serebrov will test a manned maneuvering unit during extravehicular activity from the Mir space station planned for Feb. 4 and 5. The two conducted EVAs on Jan. 8 and 11 for a total of about six hours and are planning a third for Jan. 26, Tass reported.

The DAILY reports the YMK manned maneuvering unit is used with the Orlan-DMA space suit and has an independent operation time of six hours. It can move at up to 30 meters per second and operate up to 100 meters away from the space station.

AEROSPACE DAILY, JAN. 25
"TRULY TRANSFERS POLAR PLATFORM PROGRAM MANAGEMENT TO OSSA"

"Management of the polar orbiting platform development program will be shifted from the Office of Space Flight to the Office of Space Science and Applications (OSSA) under a plan approved yesterday by NASA Administrator Richard Truly."

The DAILY reports William Lenoir, associate administrator for space flight, said the plan shifts the polar platform out of the Space Station development program and links it closer to the NASA office that will oversee the proposed Earth Observing System. He said plans for EOS observations were developed with NASA's international Space Station partners. "This transition plan was discussed with our international partners and we have assured them that agreements between us will be honored in all regards."

SPACE NEWS, JAN. 22

"NASA CONSIDERS OMV CANCELLATION"

"NASA headquarters officials are pondering whether to kill the orbital maneuvering vehicle (OMV) program, according to agency sources."

"There is a feeling to terminate it," one NASA official said. "It's pretty vulnerable."

SPACE NEWS reports the OMV is an upper stage designed to boost the Hubble Space Telescope and the Advanced X-Ray Astrophysics Facility into higher orbits as they lose altitude during the mid-1990s. The publication says the program has been plagued with high costs, now estimated at \$750 million, almost double the estimates of four years ago.

WALL STREET JOURNAL, JAN. 29

"WHOPPING NASA INCREASE PROPOSED, RAISING FUNDING 24%" Bob Davis

"The final frontier is growing fast. The Bush administration proposes a whopping 24% increase in the National Aeronautics and Space Administration's funding next fiscal year to \$15.12 billion, largely for space exploration. That means \$700 million for the proposed orbiting space station, bringing annual spending to \$2.45 billion; about \$260 million to start a grandiose satellite program to monitor Earth, and a down payment of about \$225 million on a 30 year program to send astronauts back to the moon and off to Mars."

The JOURNAL reports the spending request would make President Bush the biggest booster of civil space exploration since the early days of the Johnson administration.

The paper reports the administration proposes \$275 million for the National Aerospace Plane. That's about 10% more than this year, indicating construction may be delayed.

The story says any big exploration project will "inevitably clash" with the other new NASA program, this one called "Mission to Planet Earth." The Earth monitoring project envisions a series of expensive satellites, and a series of less expensive terrestrial monitoring stations.

AEROSPACE DAILY, JAN. 29

"SPACE STATION PRELIMINARY DESIGN REVIEW SLIPPED TO DECEMBER"

"A preliminary design review of the Space Station program has been delayed about six months to December to allow extra time for subsystem level reviews to be completed, but first element launch won't be affected, program director Richard Kohrs reported."

The DAILY reports Kohrs told reporters at a NASA headquarters briefing Thursday, that the delay won't result in a slip in the first element launch scheduled for the first quarter of 1995. The Shuttle flight sequence lists 28 launches to assembly complete in August 1999, 18 assembly and outfitting flights and 10 logistics flights.

The story reports the sequence maintains man-tended capability with the U.S. laboratory module on the seventh assembly flight in April 1996, permanent manned capability in July 1997, launch of the Japanese experiment module on assembly flight 12 in February 1998 and launch of the ESA module on assembly flight 13 in July 1998.

The DAILY reports the schedule calls for an average of five dedicated Shuttle flights each 14 months, an average of one flight every 45-60 days, Kohrs said. The assembly work will be conducted at 190 nautical miles altitude, after which the Station's hydrazine thrusters will reboost it to 220 nautical miles. Working at the lower altitude will permit the Shuttle to carry up to an additional 3,000 pounds of payload, he said.

The story reports NASA expects to request around \$2.4 billion for the program for FY '91. Kohrs said small cuts wouldn't likely affect the program, but he didn't rule out another rescoping if the cuts approach the roughly \$200 million Congress cut from NASA's \$2.1 billion request in FY '90. Cuts reduced the program's final appropriation to \$1.755 billion.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

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Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
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311.4-458

12 February 1990

TO: Distribution

FROM: Randy Cassingham

SUBJECT: SS Utilization Team Minutes for 12 February 1990

PRESENT: Rob Staehle, Randy Cassingham, Kristan Lattu, Paul Henry, Bing Chen, Sima Lisman, Gerry Murphy

Next Meeting: 19 February 1990 at 10:30 in 301-271

Note: Last week's meeting was cancelled due to travel.

Space Station Evolution Symposium

Rob Staehle, Paul Henry and Jeff H. Smith attended the Space Station Evolution Symposium last week at JSC. Other JPL attendees included Dave Hixon, Eric Biefeld, Wayne Zimmerman, Paul Backes, Brian Wilcox, Giulio Varsi, and Michael Drews.

Bill Lenoir could not attend the symposium since he was due to testify on the Hill, so he sent a videotaped greeting. He foresees three varieties of evolution for the Station: *more* capabilities, *better* capabilities (e.g., a better level of microgravity), and *different* capabilities (e.g., changed or added vehicle servicing capability). In addition, he sees four limits to growth (from a user's point-of-view): power, crew time, EVA time, and upmass.

Dick Kohrs gave a fact-filled presentation which was very good. This is the "year of the PDR" (preliminary design review), he said. About 88 PDRs are scheduled for the subsystem level and up this year. He made it clear that he expected *designs* to review, not requirements.

Kohrs gave an overview of the currently baselined Station: the March 1995 first element launch date is still firm; 75 kw power (though full-up power has been deferred from 2/97 to 11/97); crew of eight (starting at four at the permanently manned capability stage); attached payload accommodation equipment responsibility *may* be moved from GSFC to another Center; the Lab and Hab modules have switched positions due to assembly factors; power will be DC; STS suits only (although the 8 psi suits *may* be added in again later); hydrazine reboost thrusters have replaced H₂-O₂ thrusters (this also saves some power); only one airlock will be provided (the hyperbaric), though this *may* change for crew safety reasons; external payloads will be cooled by passive means only; lab payload support equipment is currently on hold (since it is still too early to pin down requirements); the CO₂ open loop is to be implemented for the first two years, then upgraded to a closed O₂CO₂ loop (*may* be revisited); ultrapure H₂O for users has been deferred; GPS installation has been deferred until the first rendezvous with the Man-Tended Free-Flyer (2/99). In other areas...

- The baseline conservatively assumes that the STS will *not* be using the advanced boosters.
- A proposal to add 12 kw to the photovoltaics is under study.
- The placement of the centrifuge is to be decided in the next few weeks.
- Micrometeor shielding is being studied; current designs may be too heavy and too stringent.
- The current requirement for 2.5 EVAs/week (after assembly complete) *just* for systems servicing **must** be reduced (possibly with increased reliance on robotics and/or an increase in external systems' reliability).
- It was allowed that it is "likely" ELVs will be utilized -- "we need to step up plans for contingency operations in case of Shuttle downtime".

Chuck Holiman/M mentioned that he has someone in his office working on orbital debris. He also noted that it would *not* be cost effective to service free-flyers from the Station because of precessing orbits; it would be cheaper to fly from the ground.

Harry McCain/GSFC, the FTS Project Manager, noted that the FTS will launch with the first element. Also, the FTS will be able to fit through the airlock, if necessary for IVA servicing. Development Flight Tests are scheduled.

Paul Henry noted that there was quite a bit of emphasis on the Human Exploration Initiative at the Symposium. Much was said about the use of the evolutionary Station as a transportation node, though there was some talk about the Research & Development evolution option.

Paul's planetary departure video was very well received; Paul got many requests for copies. Jeff Smith's presentation also went well.

Rob Staehle

Two cosmonauts were launched to Mir this weekend; they will dock Tuesday. The Soviets expect to make a profit from this mission increment; they are apparently receiving \$40 million to fly a crystal growth facility. A U.S. pharmaceutical facility will be returning with the current crew.

Kudos to Paul Henry and Jeff H. Smith and their supporting casts for their work presented at the Evolution Symposium.

A congressional committee denied a NASA request to reprogram transition development funds, but that denial has been rescinded by the committee, so the funds for Code ST have now apparently been released.

Robert Moorehead has signed off on Reston's new charter. PE&A is now called the "JPL Systems Office", or JSO. This name acknowledges what many have been calling JPL's Reston staff. Moorehead apparently did not like any of the other JPL-suggested alternative names. There will be a considerable -- but orderly -- realignment of their responsibilities. There will be less emphasis on users, more on cross-work package systems; greater emphasis on management tools and engineering processes; greater emphasis on communications and tracking, less on the end-to-end communications system. Andy Bennett will lead C&T work; he has a good relationship going with JSC, so Pasadena people working C&T should coordinate with him. It is likely the JSO will increase its role with assembly sequence issues; Mark Bergam will head this effort. Moorehead has directed that the JSO trace requirements from the PRD down to contractor specifications.

Reston has approved the WPAs on several Pasadena tasks: Ad hoc studies, Utilization analysis, and FROST development. Please discontinue using 726- accounts for these tasks -- they have been closed.

LeRC will be holding a symposium titled "Vision-21 -- Space Travel for the Next Millennium", which is billed as "a symposium devoted to speculative concepts in science and technology." It will be held April 3-4. Contact Karen Molnar at (216) 826-6795 for more information.

JSC is calling for papers for a workshop on "Artificial Intelligence and Advanced Automation Techniques for Fault Diagnosis and Recovery" on June 18. The JSC contact is Dennis Lawler at (713) 483-2037.

Rob received an OSSA position paper on crew requirements from Hershal Fitzhugh. Anyone wanting a copy should contact Rob or Fitz.

Rob also received a paper from Dick Grumm for review: *SSF USL Payload Software Development Handbook*. Anyone interested in receiving a copy for review should contact Rob or Lori Paul.

The following issues may be of interest. If you have questions, Paul Henry is our Pasadena representative and Hershel Fitzhugh is the alternate for the User Design Accommodations Working Group (UDAWG) -- they will be attending the next meeting, February 26-27. Mike Devirian is an executive member and JSO's representative.

TO: UDAWG Executive Members
FROM: Bill Ramage and Hope Sprinkle
RE: UDAWG Top Ten Issues List

[as of 1-17-90 Telecon]

The Top Ten Issues lists received, as of 1/11/90, have been consolidated into four categories. A definition of each category is as follows:

Category	Title of Category	Definition
1	Other Responsibility	These issues are being addressed and/or worked by another working group, steering group committee, work package, or level within NASA.
2	In System	These issues are already in the form of CRs. No additional work is required at this time.
3	Visible	These issues will be constantly brought to the UIP members attentions. This will be accomplished through the UDAWG status and recommendations presented at each UIP meeting.
4	Work	These are potential issues for the UDAWG to work.

Bill will discuss the method and logic of this system in more detail during the telecon on January 17, 1990. Each category and it's related issues are listed below; however, the list is not prioritized.

OTHER RESPONSIBILITY

Extravehicular Activity (EVA) Allocation
Contamination (type/measurement)
Lab Support Equipment (LSE)
Section 5 to Section 3 Requirements [of PDRD]
Rack Internal Volume For User
Portable Glovebox Deletion
Spare Solar Array Deferral
Safety
Data Management System (DMS)
Process Materials Management System (PMMS)/Waste Management
Documentation Reimbursement policy
Centrifuge Location/Integration
Station Stability

IN SYSTEM

Attached Payload Accommodation Equipment (APAE) and Attached Payload Locations
Late/Early Access
Video
Zone Of Exclusion (ZOE) Recorder
Microgravity Level
Data Management System (DMS)

External Stowage

VISIBLE

Power
Rack Volume Allocation
Crew Time/Size
Telescience Deletion
Mobile Servicing System (MSS) Plane Change

WORK

Windows
Acceleration Mapping System (AMS)
Standard Rack/Interface
Water
Logistics (volume/upmass for users)
Requirement Integration Groups (RIG) Implementation
Attitude Determination System
Payload Pointing System (PPS) Deletion
N2 Pressure Reduction

Note: DMS is placed in two categories.

Kristan Lattu

It has been reported that the preliminary design review for the data management system has been completed, but apparently this is only for the software portion of the DMS.

A SSF Particulate & Gasses Working Group meeting will be held at JSC February 21-22. No one from JPL is attending as yet. For info on the meeting, contact Steve Jacobs/JSC at FTS 483-8919.

Kristan is meeting with Bob Rhome/E next week to discuss possible further studies on her payload life extension task (e.g., performing lifecycle vs up-front costing tradeoffs). She and Valerie Thomas/521 will discuss how 521's Reliability Trend Analysis task will be characterized in Kristan's presentation.

Paul Henry

The planetary departure video was well received at the Space Station Evolution Symposium. Some suggestions for minor changes were made; it will be "polished" a little before final release. Rob will be presenting the video at a "Mars Overview" meeting in Boulder, Colorado on Friday. Former NASA Administrator Tom Paine is to be among the attendees.

The Stand-Alone Kit analysis is nearly complete. The Kit, an outgrowth of Paul's Payload Accommodations Strategies task, would allow small external payloads to be attached to the Station without using a normal attach point -- the kit would provide needed utilities.

Bing Chen

Bing attended the ISET (Intercenter System Engineering Team) meeting last week. ISET is reviewing station facility and experiment component commonality issues for Code EN.

Sima Lisman

Sima gave a demo of the Disturbance Simulation and Management Tool at the ISET meeting. About 20 people attended; it was quite well received. Because of a loaded agenda, a slot for a demo at the upcoming UDAWG meeting is in jeopardy; Bob Laskin will work this issue.

Gerry Murphy

Gerry is proceeding on his SSU tasks on environmental issues. The tasks focus on neutral plasma, supporting SSU's involvement with environmental issues, and definition of environmental guidelines. A JPL environmental seminar targeted for users is in the works for early summer, but details are still being worked out. Rob has approved his WPAs and SRMs, and sent them on to Mike Devirian for final approval.

Lori Paul

Lori was unable to come to the meeting, but sends word that she is in receipt of two papers from Germany (in English): *Experiences with and Error Handling in a Knowledge Base Assisted System for Payload Experiment Automation* by G. Kegel and H. Tolle (photocopy, undated -- late 1989?), and *On a Knowledge Base Assisted System for Highly Autonomous Control of Experiment-Manipulators in the Man-Tended Free Flyer* by G. Kegel, A. Abdulwahab and R. Bruder (dated November 1987).

Upcoming Meetings

February 15: Science Utilization Management Team monthly videoconference on pressurized payloads. 2:30 pm in the VITS room. Hershal Fitzhugh to attend.
February 21-22: OSSA Program Review meeting in Washington DC. Rob Staehle, Hershal Fitzhugh and Kristan Lattu to attend.
February 26-27: User Operations Working Group meeting in Fairfax VA. No one slated to attend.
February 26-27: UDAWG (User Design Accommodations Working Group) meeting in Fairfax VA. Hershal Fitzhugh and Paul Henry to attend. Bob Laskin to demonstrate the Disturbance Simulation and Management Tool.
March 1-2: User Integration Panel meeting in Fairfax VA. Rob Staehle and Hershal Fitzhugh to attend.
March 20-23: Mission Management Director's Review/Science Utilization Management Director's Review (OSSA) meeting at KSC. Hershal Fitzhugh, Robert H. White and Rob Staehle to attend.
April 3-5: Attached Payload Investigators workshop at BDM in Columbus MD. Hershal Fitzhugh, Peter Tsou and Rob Staehle to attend.
May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

AEROSPACE DAILY, JAN. 31

"ESA REVIEWING NASA OFFER TO MOVE UP SPACE STATION MODULE LAUNCH"

"NASA wants to move the European Space Agency's science module up in the Space Station assembly sequence and ESA Director General Reimar Luest said yesterday that the proposal is receiving serious consideration."

The DAILY reports Luest told the House Science, Space and Technology Committee that the change would mean less power would be available to conduct experiments early on, but it is enough of a change from NASA's current position to warrant serious consideration.

The story says details of the proposal were not immediately available, but Luest said they were contained in a letter received in Paris on Friday that dealt with the ESA module and a second letter received Monday in Washington that involved the man-tended free flyer.

The DAILY reports representatives of ESA, West Germany, Italy and Japan told the committee that NASA's decision last summer to rescope the program without their input cost them financially and hurt the U.S. politically when the other governments questioned the U.S. commitment to international cooperation.

The story reports the revised Space Station development plan that came out of the rescoping "departed radically from the letter and spirit of the memorandum of understanding" between NASA and ESA, Luest told the committee. He said each one year delay in launching the ESA module costs the Europeans between \$200 million and \$300 million to maintain the industry and government teams and to stretch the production schedule.

Akira Kubozono, executive director of the National Space Development Agency (NASDA), told the committee delays up to now have not greatly affected development of the Japanese Experiment Module (JEM), but will become more serious as the program shifts into full-scale development.

AEROSPACE DAILY, FEB. 1

"NASA PROPOSAL TO ESA COULD DELAY U.S. UTILIZATION OF STATION"

"NASA's proposal to launch the European Space Agency's attached pressurized laboratory module (APM) to the Space Station about eight months earlier than planned would significantly reduce use of the U.S. laboratory module for an equal time, according to documents obtained by The DAILY yesterday."

The paper reports the APM is schedule for launch in June 1998 on Space Shuttle assembly and outfitting flight 15. NASA's proposal would shift the module to flight 13 or 14, which would occur between July and September 1997, according to a Jan. 26 letter from Robert W. Moorehead, deputy director for Space Station program operations, to Franco Emiliani, head of ESA's Columbus program department in Paris.

The story reports Morehead said the change would mean that ESA's module would have only about three kilowatts of "stay alive" power until the Station's outboard photovoltaic solar arrays are delivered on flight 18 in the second quarter of 1998.

"The 3 KW allocation should cover all requirements to keep the APM functional, but not to operate it," Morehead said. "Power to operate the laboratory will come from placing the U.S. laboratory in the 'stay alive' mode and allocating this power to the APM."

Morehead said power to conduct experiments would come from the six kilowatts allotted to users at that point in the assembly sequence. "This power level is at least comparable to a Spacelab mission and effectively delays significant United States utilization for approximately eight months," Morehead said. "This delay may be unacceptable to the United States user community."

The DAILY reports ESA Director General Reimar Luest told the House Science, Space and Technology Committee Tuesday, that the proposal "certainly reduces our concerns and (could) be the basis for compromise among the partners."

WASHINGTON POST, FEB. 2

"SOVIETS TEST SPACE CYCLE"

"Soviet cosmonaut Alexander Serebrov cruised through space on a special "motorcycle" designed to rescue space crewmen in distress and help in the repair of malfunctioning satellites. It was the maiden voyage of the 480 pound, 32 motor vehicle, and Soviet officials said it performed well.

The POST reports the device, formally known as the Cosmonaut Movement System and looks more like a floating armchair than a motorcycle, is similar to the Manned Manuvering Unit that U.S. astronauts have used, Soviet space official say.

UNITED PRESS INTERNATIONAL, JAN. 31 William Harwood

"Concerned space engineers are running a battery of tests to pin down what caused part of a \$100 million shuttle communications satellite to fail Jan. 15 and whether the problem can be fixed, officials said Wednesday."

UPI reports NASA's western Tracking and Data Relay Satellite malfunctioned Jan. 15, leaving the spacecraft with only one fully operational high data rate KU-band communications channel. While a second KU-band system is working properly, the "TDRS-West" satellite no longer has a backup high-speed communications channel and an other failure could cripple NASA's space tracking and data relay netowrk.

The story reports NASA does not believe the trouble will cause any major problems with testing and operation of the Hubble Space Telescope scheduled for launch around April 18 that must use the Tracking and Data Relay Satellite system to send data back to Earth.

AEROSPACE DAILY, FEB. 7

"SUBSTANTIAL CUT COULD IMPERIL SPACE STATION PROGRAM: TRULY"

"A substantial cut in the \$2.6 billion FY '91 request for the Space Station would likely force another rescoping and could result in withdrawal of the international partners, NASA officials told the House Science, Space and Technology Committee yesterday."

The DAILY reports Chairman Robert Roe said the request, part of NASA's \$15.1 billion budget proposal, would be difficult to defend. He asked Administrator Richard Truly what effect a \$500 million cut would have on the program.

"It would not be the Space Station Freedom as we know it today," Truly replied.

The story reports more than half of the hearing was spent discussing the Station.

"With rather large cuts in the coming year, I don't think we're going to see the same Space Station program," Deputy Administrator J.R. Thompson testified. "And whether the internationals are involved, it may not be our option. They may chose to opt out with any kind of stretchout."

The DAILY reports the Office of Management and Budget cut about \$110 million of NASA's Station request and Associate Administrator for Space Flight William Lenoir said it is "as lean a program as we can reasonably put together."

The story says under questioning from Rep. Bill Nelson, Truly said NASA included about \$10 million to continue studies of the Shuttle-C cargo carrier. The story reports Nelson "berated" NASA for not providing more information to the Committee on how NASA planned to use Shuttle-C, but Lenoir countered that the Station alone could not justify its development and that NASA was waiting for the moon/Mars initiative to develop before committing to a heavy lift vehicle.

UNITED PRESS INTERNATIONAL, FEB. 7 William Harwood

"A falling science satellite rescued by the shuttle Columbia last month is riddled with thousands of tiny meteoroid craters, providing the best data yet on how such impacts affect spacecraft, a scientist said Wednesday."

UPI reports project scientist William Kinard, asked how many impact craters might ultimately be found on LDEF, said "thousands," perhaps as many as 10,000. Most were found on the side of the satellite facing in the direction of its travel and the largest measures a little more than 5 millimeters across, about two tenths of an inch.

The story reports LDEF orbited in a "gravity gradient" attitude, that is, with one end constantly facing Earth, the other deep space and one side always facing in the direction of its travel. Experiments mounted on that "leading edge" of the satellite consequently suffered more damage because of constant bombardment by highly reactive atomic oxygen in the outer reaches of Earth's atmosphere. They also suffered more impact damage from meteoroids and manmade space debris.

UPI says scientists have been surprised by the full effects of such tiny impacts, which Kinard said can expose underlying materials to vacuum and atomic oxygen while causing temperature controlling "thermal blankets" to delaminate in the immediate vicinity.

The story reports Kinard said as a result, engineers designing structures like NASA's planned Space Station will need to pay special attention to the types of materials they pick for thermal blankets and other parts.

"Almost everything we're looking at on there can be used for Space Station Freedom," Kinard said.

HUNTSVILLE NEWS, FEB. 9

"DONE DEAL": THOMPSON CONFIDENT OF SPACE STATION FUNDING"

"NASA's deputy administrator said Thursday (2/8) he's not sweating congressional approval of a \$2.5 billion budget for space station Freedom in fiscal 1991."

"I'm confident we'll be completely supported by Congress...and I think the program is on solid footing," J.R. Thompson said during a visit to the Marshall Space Flight Center.

"I don't want to sound flippanant but from what I sense from the prior support we've gotten on the Hill and in the support we've got from the administration, I think the Space Station program is a done deal," Thompson said.

The paper says Thompson wouldn't discuss the effect cutbacks might have on the program, but he did say that "we can't continue whittling at the Space Station budget and maintain the interest of our international partners."

The story reports Thompson said the European Space Agency, Japan, Canada and other countries are prepared to contribute about \$7 billion to the project. And, he said, they have made their displeasure at cutting back initial Station plans known.

"There was a lot of discussion...but I think we did the right thing in prioritizing the schedule and starting off with a little less of a Space Station as opposed to delaying the whole project," he said. "It's my experience that we ought to get up there and then grow and accomodate all the applications we'll have. I think we're committed to a Space Station, I think everyone senses that, and I think we'll go forward with it."

AEROSPACE DAILY, FEB. 13

"NASA TASK FORCE RECOMMENDS IMMEDIATE DEVELOPMENT OF SHUTTLE-C"

"A heavy lift launch vehicle like Shuttle-C should be developed in time to support the Space Station assembly sequence even at the cost of postponing other programs to support it, a NASA task force said Friday."

The DAILY says a report by the NASA Advisory Council's space transportation system says developing a heavy lifter should be part of a 10 year, \$6-8 billion program to improve the space transportation system. The program would also include research into nuclear and hypersonic airbreathing engines.

"We believe much of that expenditure would be recovered through lower operating costs and lower imposed costs on the user community," the task force said. Other space programs should be postponed to pay for the propulsion research, it said, because

"We believe it is of higher priority to have a coherent program for a robust capability than it is to meet any particular long term activity schedule."

The story reports the report said a Shuttle-derived cargo vehicle like Shuttle-C would meet Defense Department and NASA heavy lift requirements through the year 2000, and could be built from the technology base developed under the Space Shuttle program.

"We envision the (cargo vehicle) as an evolving vehicle configuration, benefiting from relevant Shuttle flight hardware improvements in cost, reliability and maintainability," the task force said. "We particularly envision (it) as transitioning to a version of the (580,000 pounds thrust) engine being developed in the joint DOD-NASA Advanced Launch System program."

AVIATION WEEK & SPACE TECHNOLOGY, FEB. 12

"SPACE STATION'S SUPPORTERS CAUTION NASA ON NEW INITIATIVES"

"Congressional supporters of the space station have warned the Bush Administration the effort must not suffer as other civil space programs expand."

AV WEEK reports leaders of the House science committee warned NASA not to compromise development of the Space Station to win increased funding of newer programs, specifically human exploration of the Moon and Mars and environmental observation of Earth.

The magazine says during a hearing last week, key members suggested to NASA Administrator Richard Truly that the agency succumbed to fiscal pressure applied by the President's Office of Management and Budget (OMB) on the Space station and Space Shuttle safety.

"I'm left with the impression the Space Station is being squeezed to make room for things like the lunar/Mars initiative," Rep. James Sensenbrenner said. He told Truly and his deputies, "First things first, and one step at a time."

AV WEEK reports later, Committee Chairman Robert Roe interjected during a discussion of spending for modifications to the Space Shuttle main engines, "Who the hell is OMB! Where do they have the technological background? If it's gotten to the point where OMB is running the whole space program, maybe we ought to get them in here."

The magazine says even Republicans on the committee seem concerned about how much political muscle the White House is willing to exert in Congress for NASA.

"Certainly, the President ought to be willing to go to the mat on this budget," Rep. Ron Packard said.

"The fact is this committee is going to support the request. I don't think there's any doubt about that," Roe said of the proposed NASA budget. Members said the real battle will come in Appropriations subcommittees, which weight disparate federal programs against each other.

"Let's talk about politics, because that's what this is all about," Sensenbrenner said. "The Station is going to be target number one when it goes into that Appropriations subcommittee."

NEW YORK TIMES, FEB. 14

"SOVIET TEAM DOCKS IN SPACE IN A MISSION FOR PROFIT"

"The first Soviet mission intended to turn a profit in space arrived today (Tuesday) at the Mir orbital station."

The TIMES reports the Soyuz TM-9 spacecraft, carrying Anatoly Solovyov, the mission commander, and Aleksandr Balandin, the flight engineer, docked with the space station yesterday morning. The Soviet news agency Tass said the cosmonauts reported no difficulties.

The paper reports the mission is being underwritten by a plan to produce crystals in space for industrial use. The cost of the new six month mission is estimated at \$133 million, but the mission is expected to earn \$175 million, mainly from making the crystals, Tass said.

The story reports the crystals will be made on a new specialized module that is scheduled to arrive at the space station in April.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Arnett, James	521	301-466	4-9282		JArnett
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston	8-457-7592	RBeatty	
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBreckinridge
Brunstein, Sam	334	300-243	4-2561		
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	183-401	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	303-308 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	113-114	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	512-202	7-9130		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	

	Sec	Mail Stop	Phone	NASAmail	TELEmail
Lyu, Michael	522	301-476	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA	95204		MHumfreville
McGraw, Ken	311	601-237	4-1121		
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Olivieri, Jerry	311	601-237	4-1186	JEOLivieri	
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	264-648	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 99 (80 paper, 19 NASAmail) * Printed 13 February 1990


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-461

19 February 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Utilization Team Minutes for 19 February 1990

PRESENT: Paul Henry, Randy Cassingham, Sima Lisman, Gerry Murphy, Kristan Lattu, Lori Paul, Tom Handley

Next Meeting: 5 March 1990 at 10:30 in 301-271

Note: Next week's meeting is **cancelled** due to travel.

Paul Henry

Paul, Dick Levin and Leigh Rosenberg met with Jim Arnett, Valerie Thomas and Gerry Murphy of the Reliability Engineering Section to discuss relative costs of different space hardware classes relative to the Stand-Alone Kit concept, an alternative means to accommodate SARR and distributed attached payloads on the Station.

The final report for Mars missions trajectories and arrival conditions is in preparation for Brian Pritchard/LARC.

Randy Cassingham

The February issue of Code SU's *Station Break* newsletter is out. Randy has received a limited number of them; anyone wishing a copy should contact him. The most interesting part: a page showing the Program's milestones through CY 1999 and the PDR schedule. This page is reproduced on the last page of the minutes.

Sima Lisman

It has been confirmed that the demonstration of the Disturbance Management Tool, scheduled for the next UDAWG meeting, has been removed from the agenda because of the lack of available time. Bob Laskin will try to get on the agenda for a future meeting.

Kristan Lattu

Fitz is working on his presentations for the OSSA Program Review meeting, scheduled for later this week in Washington.

Kristan is meeting with Gerry Murphy and Jim Arnett to discuss Kristan's plan to continue and expand her payload life extension task. Her scheduled meeting with Bob Rhome/E (to pitch the work) has been postponed.

Lori Paul

The Quest to connect to TMIS continues with no significant headway. Lori spent some time talking with JPL's TMIS rep, Jim Jacobson; the software necessary to make a PC-type computer (as opposed to using a Apollo TMIS workstation) apparently does not actually exist. She is now trying to track down a special \$695 network card that may do the trick. (The issue of trying to get JPL on

TMIS was discussed at length at the meeting; many are quite frustrated that we cannot seem to get the latest versions of various documents that are apparently only available via TMIS. In the meantime, Lori is doing her best to get paper copies of the various documents for the Space Station library.)

Tom Handley

The final outline for the *End-to-End Communications System Architecture Description Document* is complete; the first draft of the document should be done on time, in March.

Upcoming Meetings

February 21-22: OSSA Program Review meeting in Washington DC. Rob Staehle, Hershal Fitzhugh and Kristan Lattu to attend.

February 26-27: User Operations Working Group meeting in Fairfax VA. No one slated to attend.

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Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

AEROSPACE DAILY, FEB. 15

"NASA TO PRESS CONGRESS FOR SPACE STATION EVOLUTION STUDY FUNDING

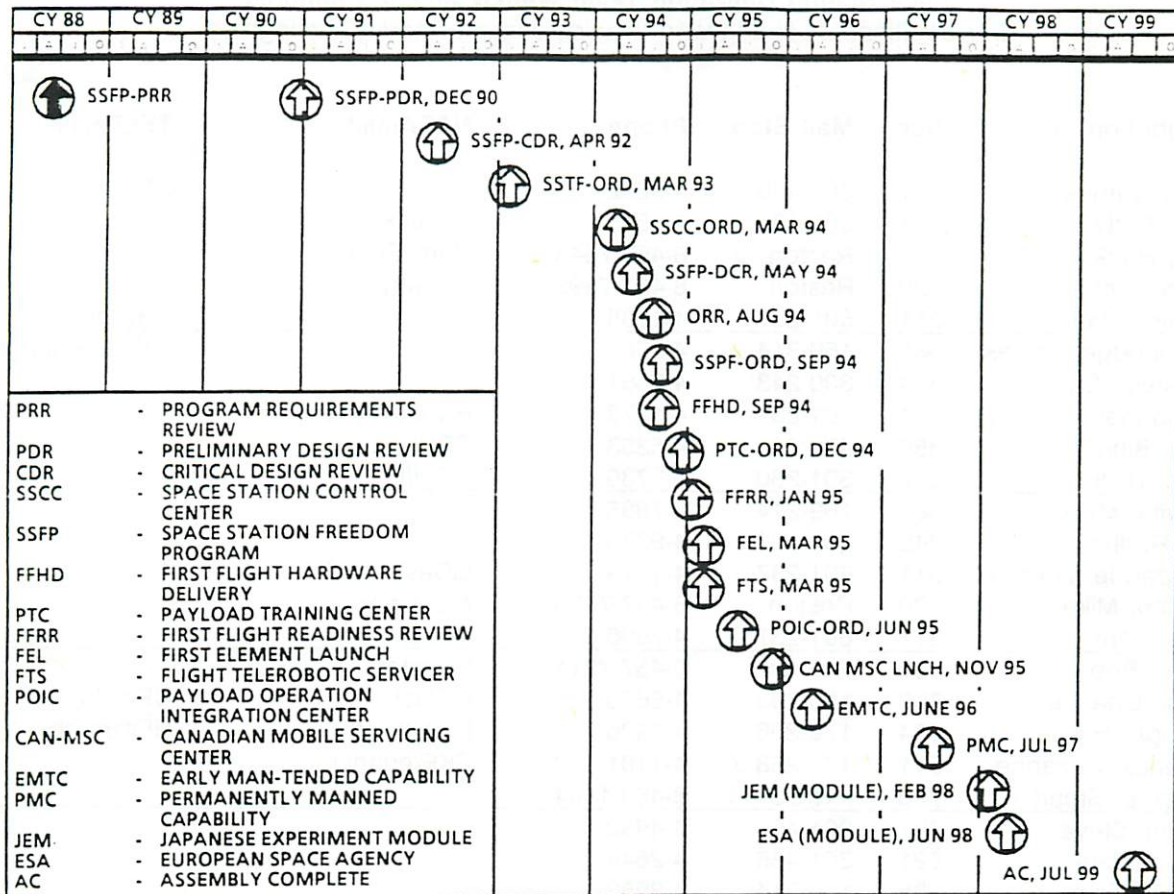
"NASA will appeal congressional rejection of a request to allocate \$9 million for studies planned in fiscal 1990 of modifications to the baseline Space Station so it could be used as a base to assemble and service spacecraft for trips to the moon and Mars, agency officials said yesterday."

"The program director is very much concerned that we...identify the things that need to be included in the baseline program so we can evolve to support the (human exploration) initiative, Lewis Peach Jr., deputy director for strategic plans and programs, said.

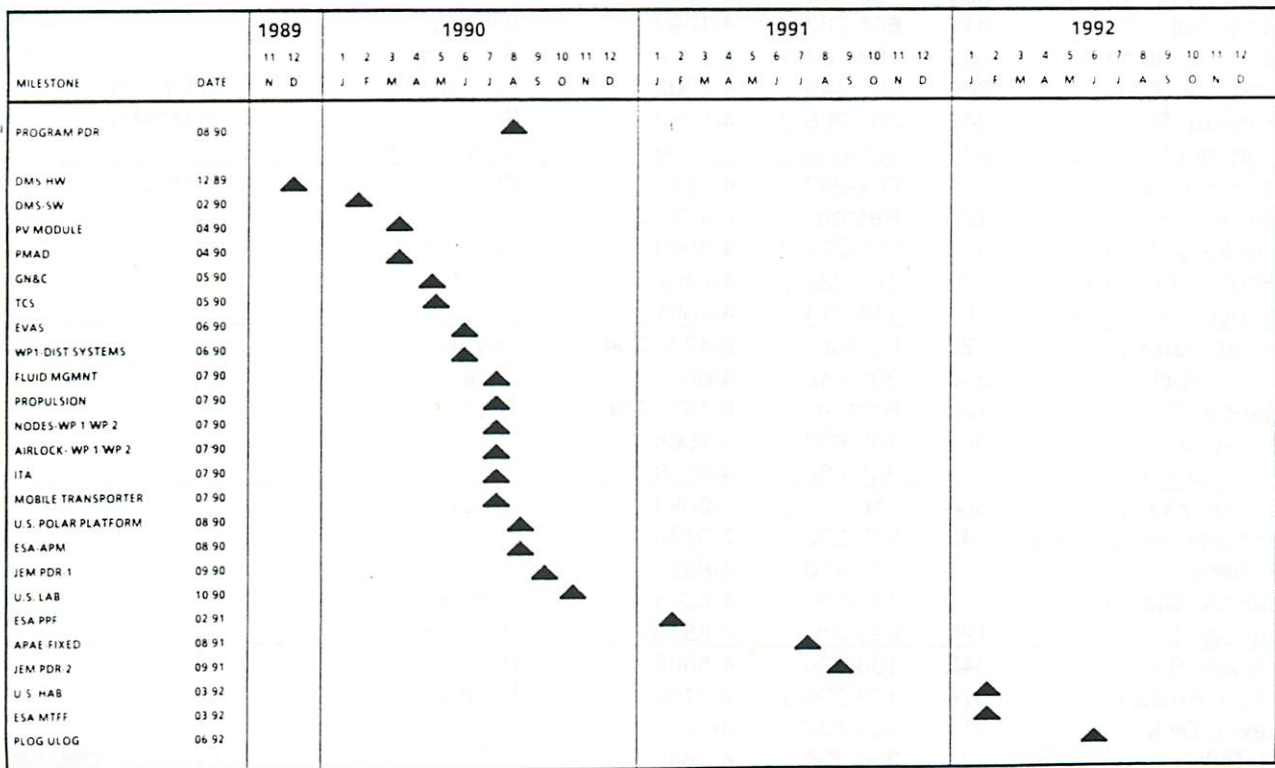
The DAILY reports the House and Senate appropriations subcommittees that oversee NASA's budget rejected the proposal in the agency's FY '90 budget request and rejected it again when NASA offered to reprogram money for the studies in an FY '90 operating plan sent to Congress Jan. 5.

The story reports program officials want to finish the studies before the Space Station undergoes a preliminary design review in December so any modifications can be incorporated early in the program. Peach said making the modifications after the Station is in orbit will be more costly.

PROGRAM MILESTONES



PROGRAM DESIGN REVIEW SCHEDULE



*ALL DATES ARE END OF MONTH

(•) LEVEL II PDR IS NOW SCHEDULED FOR 12 90

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

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Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Olivieri, Jerry	311	601-237	4-1186	JEOLivieri	
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
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Tai, Wallace	317	301-235	4-7561		
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	264-648	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-479

5 March 1990

TO: Distribution

FROM: Randy Cassingham

SUBJECT: SS Utilization Team Minutes for 5 March 1990

PRESENT: Paul Henry, Randy Cassingham, Sima Lisman, Bing Chen, Richard Grumm, Kristan Lattu, Tom Handley

Next Meeting: 12 March 1990 at 10:30 in 301-271

Note: Last week's meeting was canceled due to travel.

Paul Henry

A review of Pasadena Space Station tasks by Dick Laeser and Bob Easter of the Reston JPL Systems Office (JSO, née PE&A) will be held March 26-27. All Space Station tasks will be reviewed, with emphasis on those funded by JSO. Task managers should send draft charts to Rob Staehle by March 16; **see the attached memo from Hank Beck regarding viewgraph guidelines**. Dry runs will be held for some tasks on March 16. Locations are:

<u>March 26</u>	8:00-12:00	301-271
	12:30- 5:00	125-133
<u>March 27</u>	8:00-12:00	183-328
	12:30- 5:00	TBD

Paul attended the User Design Accommodations Working Group (UDAWG) meeting last week. They concentrated mostly on generic preparation for the various Station Preliminary Design Reviews. All the work packages gave presentations. The good news: all but WP 3 (GSFC) gave a run-down on how their PDR would run; the bad news: all of them will be different. GSFC is as yet undecided on how the WP 3 PDR would be organized and run.

Code R will be releasing their AOs for Space Station Technology experiments in July.

The final report for Mars missions trajectories and arrival conditions for Brian Pritchard/LaRC is complete; it will go to Randy this week for editorial massaging and publication.

The Mars video will be polished a bit in response to comments by the sponsor and attendees at the Space Station Evolution Symposium. Some changes to the script has been completed; narration must be recorded and some minor video changes will have to be made. Marion, the video editor, has left the Lab, so a new editor will be assigned in the next week or so.

Randy Cassingham

Now that Space Station and Space Shuttle offices have merged, many (if not all) "Code S" offices are now "Code M" offices, such as Space Station Utilization, which used to be Code SU: it is now Code MU.

Randy's on-again, off-again task to write the *Introduction to Utilizing Space Station Freedom* for Code MU is on-again (again). Remer Prince/MU has directed that the current draft be updated to

reflect changes made in "rephrasing". The *Introduction* is a user-oriented guide giving a basic overview of Station capabilities and accommodations.

Sima Lisman

Sima is working on some technology issues for Alan Lindenmoyer/SSE regarding microgravity disturbances. The next "road show" for the Disturbance Simulation and Management Tool will be at Code SSU in late March/early April.

Dick Grumm

Dick is working on updating payload science requirements. One interesting item that has come up: the lack of adequate vacuum venting is leading to a possible need for a space-qualified vacuum pump...

Kristan Lattu

A Lab Support Equipment workshop will be held at MSFC March 26-30. Bette Siegal/EM is chairing. Kristan will be attending.

An invitation-only Contamination Steering Committee meeting will be held this week to discuss the possibility of relaxing external contamination requirements; this will be based on early LDEF results. We should hear details on this within the week.

In the last weekly SUM Team telecon, there was much discussion of the UDAWG meeting and the status of the various CRs.

Kristan and Gerry Murphy have put together a task to pitch to Bob Rhome/E to develop tools to assist in the evaluation of payload proposals. It would relate lifecycle costing to payload performance to help assess lifecycle issues. This is a "spinoff" of Kristan's payload life extension task. Kristan will be coordinating with Division 52 personnel.

Tom Handley

A new Baseline Advisory Group (**BAG**) has been formed; it is a temporary advisory group to help settle baseline documentation issues, including a review of Tom's in-progress *End-to-End Communications System Architecture Description Document*. Chuck Ivie is doing most of the liaison with the group, and will attend the next meeting to report on it more fully.

Upcoming Meetings

March 20-23: Mission Management Director's Review/Science Utilization Management Director's Review (OSSA) meeting at KSC. Hershal Fitzhugh, Robert H. White and Rob Staehle to attend.

March 26-27: Pasadena Space Station task review by JSO here, room TBD.

March 26-30: Lab Support Equipment (LSE) workshop at MSFC. Kristan Lattu to attend.

April 3-5: Attached Payload Investigators workshop at BDM in Columbus MD. Hershal Fitzhugh, Peter Tsou and Rob Staehle to attend.

May 14-15: UDAWG meeting at MSFC. Paul Henry to attend.

May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

SPACE BUSINESS NEWS FEB. 19

"STATION PLANNERS LOOK 'BEYOND BASELINE'"

"HOUSTON -- It was a gathering of optimists--600 people met here to discuss how the space station should evolve in the decade beyond 2000 to meet the needs of expanded microgravity research and manned exploration.

The publication went on to say, "On the one hand they heard a litany of fantastic capabilities a future space station could support--free flyers for both research and as propellant farms, enhanced lab modules serviced by heavy lift launch vehicles and expendable rockets, servicing bays that could assemble lunar and Mars transfer vehicles."

Associate Administrator William Lenore addressed the gathering and "defined" agency choices in a presentation entitled "Space Station Beyond the Baseline". SBN reported that the participants also discussed the reality of the station's evolution and how it is limited by decisions being made today by a tight congressional budget.

SBN quoted Earl Huckins III as saying the space station will have to serve both R&D and transportation requirements.

AVIATION WEEK FEB. 19

"NEW COSMONAUT CREW ON MIR PLANS EXTENSIVE MATERIALS PROCESSING WORK"

"A Soviet replacement crew launched to the Mir space station Feb. 11 will conduct extensive materials processing during the six month stay on the vehicle".

AV WEEK says the crew of Anatoli Solovyev and Alexander Balandin will do the materials work in the Kristal Technological Module set for launch on March 30. The module will orbit the Earth on its own for about a week before it docks with the Mir station about April 7 or 8.

AEROSPACE DAILY, FEB. 22

"SHUTTLE-C WOULD DOUBLE COST OF SPACE STATION ASSEMBLY: LENOIR"

"Using the Shuttle-C to launch Space Station elements would cost twice as much as using the Space Shuttle with the advanced solid rocket motor (ASRM)," the DAILY quotes NASA's William B. Lenoir, associate administrator for space flight, in reporting to the House Science, Space and Technology Committee.

Referring to a recent NASA study, the DAILY reports Lenoir as saying that while shortening the Space Station assembly sequence by using the higher payload of Shuttle-C was not sufficient justification to develop the unmanned cargo carrier, the need for a heavy lift launch vehicle for missions to the moon and Mars could make it cost effective.

Lenoir compared Space Station assembly sequence costs, citing a price tag of \$1.5 billion using 18 Space Shuttle flights, versus 16 flights and a cost of \$1.3 billion using ASRMs on the last ten Shuttle flights. Using four Shuttle-C flights, only 14 total flights would be needed, provided four Shuttle flights used ASRMs, the DAILY reported, quoting Lenoir. He said developing Shuttle-C would cost twice as much as using ASRMs, even if his estimates were off by a factor of two.

AEROSPACE DAILY -- FEB. 21

"SPACE STATION EVOLUTION COULD HAMPER MICROGRAVITY WORK: RESEARCHER"

"Plans to use the Space Station as an assembly and refurbishment depot for spacecraft bound for the moon and Mars could hamper space-based microgravity research, a leading materials processing researcher said," quoted by the DAILY.

Citing vibration and center of gravity changes resulting from the Station's use as a transportation node, Robert J. Bayuzick, director of the Center for the Space Processing of Engineering Materials, Vanderbilt University, said the required steady-state microgravity environment would be disturbed. "There's no real logical plan to safeguard the acceleration environment" (on the station), the DAILY quotes Bayuzick as saying.

The Administration's human exploration initiative calls for use of a Space Station lower keel assembly to be used to support construction and test of a lunar transfer vehicle (LTV) following Freedom's construction in 1999. NASA officials confirmed the problems exist but that researchers will have at least four years of near-steady-state microgravity before the assembly construction is started and that an additional six months of near optimum microgravity conditions per year would exist once LTV operation is started and assembly of an upper keel and test of a Mars transfer vehicle is completed, the DAILY reported.

AVIATION WEEK -- FEBRUARY 26

"NASA TO APPOINT SEPARATE MANAGERS FOR SPACE STATION CONSTRUCTION, UTILIZATION"

"NASA plans to appoint a manager of space station utilization to act as an internal advocate for users of the manned base." The weekly reports the Associate Administrator William B. Lenoir said the new manager will serve as a foil to the manager responsible for

assembling the U.S./international facility. "My intention is to set up a somewhat adversarial role so that, every time space station design has a little bit of a problem, utilization doesn't get squeezed," wrote AVIATION WEEK, quoting Lenoir during Congressional testimony last week.

Also underway is consideration of canceling Space Lab missions and converting them to space station science missions as soon as the station reaches "man-tended capability." The possibility of using three shuttle flights per year for such science are under discussion at NASA Headquarters in Washington. Current plans would allow such work by mid-1996 follow seven assembly missions. Lenoir cited availability of "more power, more equipment," in such a scenario.

The step to separate the station management was made to avoid a "disruptive ripple effect" in the Space Station Freedom program office resulting from minor changes in either station design or plans for utilization. Candidates are being interviewed for the job of utilization chief, though completing the arrangement may take the rest of the year, AVIATION WEEK reports. Lenoir also reported to the House Space Science and Application Subcommittee's Reps. Bill Nelson and F. James Sensenbrenner that an Administration \$110 million cut in the Space Station FY '91 budget would come from a fund to cover unanticipated station hardware development problems, leaving about \$350 million in the fund. He also reported that the agency lost \$22 million in the OMB review of its FY '92 station request and \$29 million for FY '93.

AEROSPACE DAILY -- FEBRUARY 26

"ARIANESPACE TO APPOINT REVIEW BOARD, PUTS LAUNCHES ON HOLD"

"Arianespace put all future launches on hold and will appoint an accident review board this week to determine why an Ariane 44L booster carrying two Japanese satellites exploded 101 seconds after liftoff Thursday night, Director General Frederic d'Allest said Friday".

D'Allest didn't want to speculate on the precise cause of the explosion, according to the DAILY, but other sources told the publication the first stage of the booster seems to have had a significant chamber pressure drop in one of its engines before it cleared the tower.

The DAILY story reports telemetry from the booster indicated that the initial problem occurred at 6.2 seconds into the flight when the combustion chamber pressure in engine D (one of four) dropped nearly 50 percent within a half-second. The first visual indication that something was wrong was when the booster drifted towards the 225 foot umbilical tower and the rocket engine plumes brushed the side and top of the tower. Aside from getting scorched the tower was not badly damaged.

The loss of the 44L ends a string of 17 straight successful launches by Arianespace. This is the first time in 10 years the Viking V first stage engine has failed at lift off.

THE WASHINGTON TIMES - MARCH 1

"BACK TO THE FUTURE" (AN EDITORIAL)

"Mars, the moon and near-Earth space may not be the final frontier, but they should certainly be the next frontier for America...The United States now stands at a point in history where it controls not only the technology but also the material wealth to begin opening, developing and even colonizing space as our predecessors colonized the New World."

The TIMES calls for Congress to "get on board and pass the president's NASA budget without cutting funding for the Space Station or the lunar and Mars programs." The editorial supports its argument with the proven success of Voyager and calls to attention the Apollo missions to the moon as well as "our national renaissance" appreciated by President Bush's commitment to put men on Mars by the middle of the next century.

The TIMES decries the "downside" Mission to Planet Earth, termed "reasonable on its face ..., but co-opted by the high priests of environmental ecumenicism and declares that "this hands-across-the-world "greenism" should never get off the launching pad.

NEW YORK TIMES -- MARCH 6

"U.S. PANEL CITES RISK IN NASA SPACE PLAN"

"Before carrying out President Bush's proposal for a base on the Moon and a manned mission to Mars, the space agency needs to study new technologies and eliminate 'unacceptable risks to the crew,' the National Research Council says."

The TIMES quotes the council report saying NASA's exploration plan does not analyze all the technically credible approaches and that current plans for the Space Station are not adequate for a Moon-Mars mission. (It) "may or may not be the most appropriate staging base for the Moon and Mars..."

The article cites the council's call for space nuclear technology for power and propulsion and related safety/ public acceptance issues; exploration of international cooperation; concern for unacceptable health risks of long-term zero-gravity space flight given current physiological knowledge and the related artificial gravity design issues for vehicles and bases.


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

JSO HHB 90-010

Tuesday, March 6, 1990

TO: Distribution
FROM: H. H. Beck
SUBJECT: Review of Pasadena Tasks



The recent clarification of our role at Level II, and subsequent reorganization of the Reston office, necessitates that we review and evaluate the Space Station Freedom related work which is being conducted in Pasadena. This review is planned for March 26 and 27.

As in the past, we would like to include the following information for each task; one vue-graph or less per subject should be adequate:

- Task objective
- History and background
- Status and accomplishments
- Task schedule
- Issues and problems
- Fiscal status and resource requirements
- External commitments and/or expectations
- Proposed changes in scope or direction

Prior to the review, we will provide you with the results of the Level II Program Operation Plan Review to be held March 15. At that time we will have a clearer idea of our budgetary constraints for the remainder of FY90 and FY91 and will be prepared to provide a task plan for the JSO sponsored Pasadena tasks which may embody some phase outs. Consider the status review to be an opportunity to submit any reclamas to that plan.

R. Staehle has agreed to coordinate the agenda.

Following is a list of the activities to be reviewed including a preliminary heads-up where appropriate.

Activity Responsibility

Communications Systems Div

Utilization Analysis	P. Henry
Disturbance Model Development (*)	S. Lisman
FROST Development	J. L. Smith
EEIS Studies Support	T. Handley
Ad Hoc Support	R. Staehle

Management Systems Div

SDTM Management	J.L. Smith
SDTM Development	J.L. Smith
Station Description	J.L. Smith
Documentation	L. Crary
Product Assurance	J.L. Smith

EPS	S. Krauthamer
RAM	M. Lyu
IT&V (**)	W. Moore
Pressurization Study	F. Tillman

SSFSO (Delegated tasks)

Data Dictionary/Directory	T. Handley
VAPEPS	T. Scharton
Pricing Policy	J.L. Smith
User Environmental Design(EMI)	G. Murphy
MESSOC/Operations Cost Modeling	R. Shishko
User's Guide	L. Crary
SE&I Study	J.L. Smith

(*) Task does not appear to fit within JSO charter; potential candidate for phase out

(**) Need to review growth plans

Concur: _____
R. W. Easter

Distribution:

R. Staehle
J. L. Smith

cc:

R. Cassingham for distribution to reviewees

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Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204			MHumfreville
McGraw, Ken	311	601-237	4-1121		
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Olivieri, Jerry	311	601-237	4-1186	JEolivieri	
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	264-648	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

✓ = Sent via NASAmail. To switch to NASAmail delivery, please send message to RCassingham.

Total: 100 (81 paper, 19 NASAmail) * Printed 6 March 1990

R. Cassingham

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-478

12 March 1990

TO: Distribution

FROM: Randy Cassingham *RC*

SUBJECT: SS Utilization Team Minutes for 12 March 1990

PRESENT: Rob Staehle, Randy Cassingham, Jeff L. Smith, Gerry Murphy, Richard Grumm, Chuck Ivie, Sima Lisman, Hershal Fitzhugh, Lori Paul, Paul Henry, Kristan Lattu

Next Meeting: 19 March 1990 at 10:30 in 301-271

Rob Staehle

Everyone should make sure they saw last week's minutes for the memo from Andy Beck regarding the March 26-27 Space Station review meeting. The first half hour (i.e., Monday at 8:30) will be taken by an overview of current Space Station and JSO status by Dick Laeser and Bob Easter. All task managers should attend; others are encouraged to attend. The second half hour will be a programmatic discussion for section managers; it is by invitation only. Rob is working on the agenda. He mentions that task managers should keep four things in mind when preparing for the review:

- An emphasis on recent, tangible results (results since the last Reston review, which was held in June).
- Expected results, especially those which influence any upcoming PDRs.
- Identify any problems you need assistance with.
- Show how the task fits in with JSO's new charter.

Each task manager should invite his or her task participants to the review of their task, and to any other relevant portions of the meetings.

All Code S offices are now referred to as Code M offices (such as SSR, which is now MSR; Remer Prince is MUU). There is no longer a Code S. This is due to the merger between Space Station and Space Shuttle management.

Rob has a copy of a fairly detailed English-language payload interface specifications paper on the Soviet Proton booster, should anyone wish a copy.

Rob and Hershal Fitzhugh attended the OSSA semi-annual Space Station utilization review meeting February 21-22 in Washington. Among the highlights:

- There was much discussion of the Data Management System's shortcomings and the large number of RIDs being generated in the first PDR. Rob has copies of some of the presentation materials on this, and will forward copies to the appropriate people.
- Control of the EXOICE experiment was shown to reside at JSC. It is not clear if any link to JPL is planned, but the experiment is not planned to be highly interactive.
- Control of the Microgravity Containerless Processing Facility was shown to reside at JPL as a Discipline Ops Team (DOT), but not as a DOC (Discipline Operations Center).
- There was much discussion of contamination issues, from gasses, plasma, EMI, etc. An OSSA external contamination workshop will be held in July or August; Gerry Murphy should keep on this, maintaining contact with Mark Sistilli/EM.
- There is a new NMI (8010.1A) regarding Reliability Classification of NASA Payloads. There were some strong objections raised, especially regarding paperwork and analysis requirements that add little to the value of payloads. Bob White plans to make strenuous objections.

- There were many complaints about the proliferation of user documentation -- something we repeatedly warned the Utilization office about several years ago (and for which a preventative documentation structure was proposed and all but adopted by the then-Code SU management).
- Phil Cressy spoke about commonality issues for attached payloads -- there are differences between the accommodations at the attachment points and those on the JEM exposed facility, for example. There may be European interest in trading Columbus rack space for attached payload accommodations.
- Regarding the PDR process, it was said that the "real" PDRs are the dry runs which take place at the contractor's plants; by the time the "official" PDRs are done at the Centers, nearly everything is "cast in concrete". Many participants were surprised by this arrangement.
- There were heated discussions about the various Program data bases. There are quite a few different data bases holding user payload information:
 - SUMITS -- contains high-level approximations for Code M management; gets its inputs from ESUMITS
 - ESUMITS -- Code EM data base; gets its inputs from SUMS or MSAD
 - MSAD -- Code EN data base; inputs from Code EN payload users
 - SUMS -- the "only good one", according to Fitz. Designed by engineers; gets inputs from non-Code EN payload users.

Rob also attended the User Integration Panel meeting March 1-2 in Fairfax. The meeting centered on updates on change requests and subsystem status. There was also an interesting discussion regarding the alternative assembly sequence (where the International modules would go up sooner, but their experiments would not be operable from lack of power). There has been much contingency planning with regard to assembly flights, but the details of this planning are not openly available. Bill Bastedo/Level II is working the assembly issues; Mark Bergam is the JSO contact regarding assembly issues.

Jeff H. Smith, Richard Levin and Liz Carpenter are about to release the paper, *An Application of Multi-attribute Decision Analysis to the Space Station Freedom Program: Case Study, Automation and Robotics Technology Evaluation*. Other miscellaneous documents of interest that are available:

- *WP-2 User Accommodations Design Data Package* by McDonnell Douglas, dated 2/90. Contact Randy Cassingham for copies. Contact Rob for copies of:
- *Space Station Freedom Crew Requirements Position Paper* from OSSA, dated 1/5/90.
- *Toward Effective International Cooperation for Science on Space Station Freedom* (Executive Summary and full document), a Joint Science Utilization Study by NASA, ESA, NASDA and the Canadian Space Agency.
- *OSSA Operational Analysis of the Alternate Assembly Sequence*, dated 2/20/90.

Mark Albrecht, who is the Executive Secretary of the National Space Council reporting to the Vice President, will address the Southern California Space Business Roundtable meeting in Los Angeles on April 6. Rob has details for anyone interested. Other upcoming meetings of interest on which Rob has details:

- The OSSA attached payload workshop April 3-5 in Columbus. Rob has the agenda.
- The "Space Summit", an international symposium on manned space exploration, June 3-6 in Huntsville.
- The 1990 Case for Mars Conference will be held June 3-6 in Boulder. Rob will be attending.
- The First International Symposium on Measurement and Control in Robotics, June 20-22 at JSC.
- AIAA/NASA Second International Symposium on Space Information Systems, September 17-19 at the Pasadena Hilton.

Jeff L. Smith

ESA representatives will be at JPL for a "Spring Fling" in May for a week to discuss their End-to-End Communications System concerns. One objective is to solicit ESA input on EECS issues. Jeff will be using FROST (the Freedom Operations Simulation Testbed) to give them some realistic ideas

as to the system's capabilities. Richard Beatty is setting the meeting up. A new release of FROST will be out in April (in time for the meeting). In the meantime, Jeff is concerned over bandwidth (data rate) issues. The maximum theoretical bandwidth on the Station networks is not at all likely to match actual typical performance, which will be on the order of 30-50% of maximum. This issue needs much more study.

Chuck Ivie

Chuck had a series of meetings with Bob Vuolo and Mike Devirian to propose an integrated EECS analysis task. Their work so far on object definition is providing results which are expected to prove useful in raising the fidelity of FROST modelling. Chuck is also recommending that the EECS be modelled with a hybrid of simulation software (e.g., FROST) and as much real hardware as possible.

Regarding the new BAG (the Baseline Advisory Group, described briefly last week by Tom Handley): Chuck is a member. They are trying to determine if the baseline Station will meet requirements, but they "aren't sure yet how to tell". At this point, simulation tools are not developed far enough to accurately check proposed designs and architectures against requirements. They are also looking at the nine different data types that will go through the DMS and what the implications are to DMS architecture; there are many ramifications possible on communications between the ground and the Station. No one is sure yet what the impact will be, or how serious of a problem it might become.

Chuck (and others) are worried that the current "command checking" environment may prohibit some types of science which are better suited to the so-called transaction management approach.

Gerry Murphy

Gerry will be attending a meeting next week regarding ionizing radiation. A recent JSC meeting to review an ionizing radiation and plasma environments document found the document to be inadequate. Representatives from all Work Packages and prime contractors were there. A change request to provide an EMI "quiet zone" for attached payloads was also discussed; Gerry thinks it looks realistic.

Dick Grumm

Dick is concerned that contact between payload people and the people (i.e., contractors) that are actually building the Space Station payload accommodations hardware is conspicuously missing. The only official link is via data bases -- in Dick's experience, this is exactly how not to do it. Dick does not feel that any data base, even the engineering-oriented SUMS, conveys sufficient fidelity, quantity or accuracy of information for Work Package design engineers to act on in ways that would best enhance the usefulness of the Station. Official information from Codes E and M often flows too slowly to be useful to contractors when its incorporation would be feasible.

Sima Lisman

Alan Lindenmoyer/SSE has delegated some microgravity work to Steve del Basso/SSEIC Grumman; Sima is coordinating with del Basso to demonstrate the benefits and explain minor variations between her Disturbance Simulation and Management Tool and all-up NASTRAN simulators. Al Lindenmoyer's support is contingent on del Basso's satisfaction on a technical level.

Hershal Fitzhugh

Fitz has heard that, contrary to recent rumors, GSFC *will* be keeping the remains of WP3 in their camp (the bulk of WP3 -- EOS -- has been transferred out of the Station's purview).

Fitz has drawings of the Station's Payload Interface Adapter in hand.

There will be a videocon on the PMMS on March 29. The DMS systems PDR (part 3 of 3 DMS PDRs) will be held by videocon on March 30. Interestingly, from the DMS PDR part 2 (hardware), 3500 RIDs were written (100 by OSSA), showing that there is a lot of concern about the DMS.

At the recent OSSA Payload Processing Working Group meeting, Randy Tilley gave a presentation and said that there would be procured "enough flight racks for the modules, plus 20". Fitz told him that this was not enough, and Tilley took that quite well. Bette Siegal will be talking more about racks at the next OPPWG meeting; Fitz will talk with her about the problem. JPL personnel and others feel that flight racks need to be provided to instrument development centers to avoid the kind of problems we experienced integrating Taylor Wang's hardware on Spacelab at KSC.

Fitz has been drafted into Code EM's Spacelab Improvement Working Group, and is interested in input from anyone with ideas on how to improve Spacelab.

Fitz and Bob White met with Dave Stoughton/EM to discuss the payload classification document that EM has been working on for the past year and the new preliminary 8010.1A document that Code Q has since generated.

Lori Paul

Lori has set up a meeting with TMIS people to help resolve the problems she has been having linking up with the system. Attending the meeting Wednesday will be Rob Staehle, Jim Jacobson (the JPL TMIS rep), Jerry Olivieri, and [?]/JSO.

Paul Henry

The Stand-Alone Kit will be completed in time for the Space Station task review.

Paul has completed his changes to the Mars trajectory video script; all he is waiting for is a new video tech to be assigned to the task (the previous, Marion, has left the Lab).

Upcoming Meetings

March 20-23: Mission Management Director's Review/Science Utilization Management Director's Review (OSSA) meeting at KSC. Hershal Fitzhugh, Kristan Lattu, Robert H. White and Rob Staehle to attend.

March 26-27: Pasadena Space Station task review by JSO here, rooms:

<u>Monday March 26</u>	8:15-12:00	301-271
	12:30- 5:00	125-133
<u>Tuesday March 27</u>	8:00- 1:00	183-328
	2:30- 5:00	180-703B

March 26-30: Lab Support Equipment (LSE) workshop at MSFC. Kristan Lattu to attend.

April 3-5: Attached Payload Investigators workshop at BDM in Columbus MD. Hershal Fitzhugh, Peter Tsou, Gerry Murphy and Rob Staehle to attend.

May 14-15: UDAWG meeting at MSFC. Paul Henry and Hershal Fitzhugh to attend.

May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

June 3-6: Case For Mars symposium in Boulder. Rob Staehle to attend.

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September 17-:19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

LOS ANGELES TIMES -- MARCH 5

"SPACE TRASH" By Lee Dye

"Every space scientist knows it is bound to happen sometime: A piece of space junk the size of a walnut will rip through an orbiting satellite, or worse still, a manned spacecraft, placing the craft and crew in grave danger."

The TIMES reports in the face of the threat of thousands of such particles, NASA is trying to develop an early warning system to give astronauts time to at least prepare for a hit. While a radar system would require too much energy, NASA Johnson Space Center engineer Faith Vilas is working on development of a small telescope to extend astronaut's vision enough to identify small particles in time to take some action.

David L. Talent, of Lockheed Engineering and Sciences Co. and principal investigator on the project, describes the telescope as operating at both optical and infrared wavelengths so it could pick up objects in sunlight, as well as in darkness, since the debris emits some heat. Like driving in a snowstorm, most snowflakes appear to curve to either side. "It's the one that doesn't move that you need to do something about," the TIMES quotes Talent.

The article describes the categories of debris and their quantity, stating that "it's the smaller stuff that could cause problems" as larger objects are tracked from the ground. NASA's Vilas believes a telescope with a 60 inch mirror would be able to identify particles as small as 1/25th of an inch at least one minute before impact, time to close hatches and seek safe haven in better protected areas.

AEROSPACE DAILY -- MARCH 7

"NASA CONSIDERING EARLIER USE OF STATION FOR SCIENCE RESEARCH"

"NASA officials are considering extending Spacelab missions to as much as 16 days by docking Space Shuttle orbiters to the partially complete Space Station beginning in 1996 to give scientists earlier access to its research facilities."

The DAILY says studies are underway by Station and space science program officials. Power, data handling and scheduling limitations are under review, according to Station official Robert Rhome.

The studies hope to be able to determine if some missions could be carried out between station assembly sequences. Being able to dock with the partly assembled station would give the orbiter more power to conduct experiments and provide more room to the Shuttle crew to move around and sleep.

According to the DAILY, Rhome said, "We don't want to upset the assembly sequence (of the station)....we just want to get the keys to the house so we can do our business".

ASSOCIATE PRESS -- MARCH 10, 1990

NASA ADMINISTRATOR TESTIFIES ON SPACE STATION NEEDS By Robert Greene

"The United States risks losing its international partners in the manned space station project if Congress cuts back on the \$2.6 billion request for the project in 1991, NASA Administrator Richard Truly says."

Truly is quoted by ASSOCIATED PRESS as telling the Senate science, technology and space subcommittee, Friday, "I think a major reduction would cause them to look very seriously at our commitment to the project".

The Space Station Freedom program has, according to the story, experienced strained relations as the result of a U.S. decision to delay completion of construction for a year without telling the partners from Japan, Canada and the European Space Agency.

Truly told the subcommittee the space station program is critical for further exploration of space, especially the moon and Mars.

According to AP, subcommittee chairman Albert Gore, of Tennessee, questioned the feasibility of getting that much money. Gore also suggested that NASA "might be cutting off more projects than it can chew", leaving open the risk of underfunding during critical years.

AVIATION WEEK -- MARCH 12 ISSUE (AN EDITORIAL)

"KEEP THE PACE ON SPACE STATION"

"Enough time has passed to put in perspective two important events that occurred last summer in the U.S. space program. President Bush, celebrating the 20th anniversary of the apex of manned spaceflight, the Apollo 11 lunar landing, announced that the U.S. would forge ahead as a spacefaring people. Americans would return to the Moon and ultimately on to Mars".

Simultaneously, the editorial says, some of the "best and brightest" in the President's space agency were meeting once again for the bureaucratic disassembly, "for the nth time", of the space station, with schedule stretching and hardware being pared in an effort to keep the project afloat."

The weekly's editorial calls for stable management, a shortfall protection mechanism to keep the station on track and a forthright message to Congress: "If you cut the money, the program will slow down, and ultimately cost more."

Citing shallow popular support as the station's biggest challenge, rather than technical or economic problems, the article calls for national leadership and commitment with President Bush playing the key role by actively articulating "his vision of where the nation is going in space, now and into the 21st century."

AVIATION WEEK AND SPACE TECHNOLOGY -- MARCH 12 "FIRST SOVIET SHUTTLE ORBITER GROUNDED FROM FUTURE FLIGHTS"

"The Soviet Buran orbiter that made the USSR's first successful space shuttle liftoff and landing will not be launched into space again."

AV WEEK reports the craft, built without life support, full avionic and fuel cell electrical systems, would be too costly to modify for future manned or unmanned flight, according to Soviet opinions. The number two Buran orbiter, nearing completion, is scheduled to fly an unmanned mission in 1991, possibly to the Mir space station.

AVIATION WEEK, FEB. 12 "SPACE STATION EFFORT ENTERS CRITICAL STAGE" By James R. Asker

"For the first time since the project was conceived, the effort to design and build a permanently manned U.S./international space station is on schedule. However, the project has entered its most difficult phase yet, with little margin for error in money or time."

AVIATION WEEK reports that to meet a 1995 construction start date NASA must manage the program and conduct a considerable number of technical reviews in the coming months. The reviews reveal design problems, as much as help solve them and space station head William B. Lenoir declares, "I will warn you, preliminary design reviews never look pretty." Grumman's Bernard Bashkoff, who manages station configuration indicates that the program is moving, however. "I'd say we're about 85% in harmony," he is quoted by the weekly. Officials also say the program will emerge this year from what seems to many outsiders as an endless period of planning. "It's no longer a paper program," says Lenoir, "It's a hardware program with real hardware."

The space agency's many reviews and rescheduling have indicated difficulties, according to the article and it points out that "Its not clear the space station currently planned by NASA will completely satisfy any of its objectives beyond offering the possibility of continuous presence of U.S. astronauts in space...(but that is) expected of any scarce scientific resource that must be allocated among competing users." It cites some limitations as a transportation mode, for microgravity research and space manufacturing.

Questions of adequate funding of the station have rankled key supporters in Congress, though NASA Deputy Administrator J.R. Thompson said "I think we've turned the corner on the [space station] budget in Congress." Many believe that funding shortfalls are not responsible for all the problems of this technically complex, long-term, multiple requirement facility, including researchers Radford Byerly, Jr., and Ronald D. Brunner of the Center for Space and Geosciences Policy at the University of Colorado. They say that (the space station program) was designed primarily to meet NASA's institutional needs for a secure program, maximizing participation and making it interdependent with the rest of NASA's space programs, according to AVIATION WEEK.

AVIATION WEEK, FEB. 12 "INTEGRATING SPACE STATION ELEMENTS IS KEY CHALLENGE TO PROGRAM MANAGERS, ENGINEERS"

"Coordinating the development of the space station's hardware and software and integrating the elements in space is the project's biggest technical challenge," says AVIATION WEEK.

Factors of geographic diversity and engineering complexity have led critics to say the program is needlessly complicated and fraught with risks to the station's schedule and budget. Space station division of responsibility was set more by function than by major components, with a "multitude of distributed systems, work package contractor interfaces, international integration and interfaces that led NASA's former space station official Thomas L. Moser to say that the [space station] "demands a higher order of systems management and control than any previous U.S. space program. Dismaying to some, others like former astronaut Fred Haise, now of Grumman, say "It's not that you don't have clean interfaces; it's that you have more interfaces."

Others question the role of the Reston office, according to the weekly, saying that the real issues are still being worked at the centers. But Goddard space station program manager Floyd Ford says "a program office is a program office, whether it's in Reston or downtown." Space Station associate director Marc Bensimon is philosophical about center/program office friction, contending that local pride is natural and an indicator of a healthy team spirit. In addition, steps have been taken adding more integration responsibility to the centers and smoothing center/program office interaction according to AVIATION WEEK.

R. Cassingham

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-493

2 April 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Utilization Team Minutes for 2 April 1990

PRESENT: Rob Staehle, Randy Cassingham, Kristan Lattu, Bing Chen, Paul Henry, Lori Paul, Sima Lisman, Jeff L. Smith

Next Meeting: 9 April 1990 at 10:30 in 301-271

Note: The last meeting held was 12 March. The last two meetings were canceled due to travel and the JSO Program review.

Rob Staehle

The National Space Council has canceled the Space Station Program. This according to an April 1 telephone call from unnamed sources.

Thanks to all for their input and participation in last week's JSO Program review. Dick and Bob seemed quite pleased with what they saw. Several action items were raised at the review:

- 1) **Bob Laskin** to advise JSO when SE&I and U&O have lent support to the Disturbance Simulation and Management Tool; the JSO-funded development of the tool will be discontinued as soon as possible.
- 2) **Paul Henry** to obtain other support for his payload accommodations task; JSO funding will discontinue for this task as soon as possible.
- 3) **Chuck Ivie** to send a WPA, deliverables list, and task schedule for the EECS Study Support task as a top priority.
- 4) **Randy Cassingham** to send Bob Easter a list of the payloads selected for Space Station concept studies.
- 5) **Rob Staehle** to link Dennis Kern with other modelling people to coordinate their efforts in getting MESSOC and SDTM into "user" communities.
- 6) **Hank Beck** to submit two service requests to his Functional Area Contact: one to ask that TMIS documentation be sent to Lori Paul, the second to request that JPL be designated a "primary user" of TMIS (currently, JPL is not designated as a user at all). To minimize costs, JPL would waive TMIS-supplied hardware.

A JPLer has been to the Cape to see LDEF. Lori Paul will track him down and try to arrange to have him come to a meeting and talk about his early observations.

A new Space Station panel has been formed: the Communications Systems Engineering Panel (CSEP), which will be chaired by Mike Devirian/JSO. It will be concerned with the coordination of communications systems requirements, functions, and interfaces across the full space/ground extent of the systems involved, including the International Partners and user communities.

JPL Reston is recruiting for about 12 positions. Anyone interested should respond to the employment announcements.

Randy Cassingham

Paul Henry's Mars Trajectory Data Book is off to the printer today.

NASA has signed an agreement with Rockwell for Rockwell to produce a logistics pallet for the Shuttle to allow it to stay aloft for up to 16 days.

Kristan Lattu

Kristan attended the Science Utilization Management Director's Review two weeks ago, and brought back several viewgraph packages and other items of interest. Among the items (some of which are attached):

- An outline of OSSA's high level program plan.
- The OSSA field center function responsibility matrix (one each for pressurized and attached payloads).
- A report on the recent DMS PDR -- DMS people should see the "early statistics".
- Phil Cressy discussed training, including the PTC (Payload Training Facility) and the SSTF (Space Station Training Facility). Kristan will be working on training issues, as well as LSE (Laboratory Support Equipment -- more on this below).

Kristan also attended the Huntsville LSE workshop. 34 pieces of "core" LSE equipment were identified, and grouped into four main areas: Life Science, Microgravity, General Support Laboratory Facilities (such as the workbench), and Preservation & Storage. Kristan notes a lot of progress is being made by this working group, including the development of LSE requirements from user input. It was noted in the working group meeting that some of the equipment developed for microgravity payloads is not needed (according to microgravity users, such as Archie Flipp/LaRC). For instance, cutting and polishing equipment is included, but most materials processing users are apparently not interested in on-board analysis; they would rather the raw crystals were shipped back for Earth-based analysis. (Protein crystal people are more likely to want immediate analysis.) Kristan brought back a draft document for review: *OSSA Space Station Freedom LSE/GLSF Level III Requirements Document*, should anyone wish to have a copy now. It will be issued in a few months.

JPL will be proposing a life science experiment for the Station. An STS precursor mission ("Worms in Space" on STS-42) will be followed up by possibly another STS mission and then by a Space Station mission. It involves the use of "enzymatic controls" to help control biological contamination buildup. ARC plant biologists are quite interested, as the Station's air could become quite "dirty" from the astronauts' presence (sweat, breath, etc.), and mechanical filtration may not be adequate. The experiment concept will be discussed soon with Bette Siegal/EM.

Jeff L. Smith

The FROST "spring fling" with ESA representatives at JPL may be pushed back several weeks as it conflicts with acceptance reviews of FROST, which is a higher priority item. Stay tuned...

Sima Lisman

Sima does not yet have a new task sponsor, but she is still working on it...

Paul Henry

Code MT money is apparently still not in yet. There may have been a bookkeeping foul up. Paul will check into it. Funds apparently arrived at JPL, but had the wrong UPN.

Paul also does not have a new sponsor for his Stand-alone Kit task; he has a call into Mark Sistilli/EM to see if he can drum up some interest. Paul will take the mockup to the Houston Evolution Working Group meeting Wednesday-Thursday next week.

Lori Paul

The Space Station library is starting to get pretty well organized. Lori is *cautiously* soliciting people to send her *useful* viewgraph packages -- some information is apparently *only* in viewgraph form (such as Kohr's overview of the Station's rephased baseline). Please include your name (don't send anonymously!), author, source, date of viewgraphs, and any important notes you have made. The library should be used for documents of use to others, rather than a repository for redundant, outdated or unneeded papers.

Upcoming Meetings

April 3-5: Attached Payload Investigators workshop at BDM in Columbus MD. Hershal Fitzhugh, Peter Tsou, Gerry Murphy and Rob Staehle to attend.

April 4-5: Evolution Working Group meeting at JSC. Paul Henry to attend.

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June 20-22: First International Symposium on Measurement and Control in Robotics at JSC. No one yet slated to attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

ORLANDO SENTINEL (AP), MARCH 15

"SPACE PROGRAM HAS APPROVAL RATING OF 80%"

"Approval of the U.S. space program is at a record high, and almost two out of three Americans favor the lunar base and Mars missions proposed by President Bush, says a survey released Wednesday."

THE SENTINEL reported that the Rockwell International Corporation commissioned Market Opinion Research survey that polled 1,200 registered voters also indicated that 74 percent favored the Space Station and 70 percent favored the National Aero-Space Plane. The poll indicated an upswing in those categories over earlier polls. 64 percent favor a return to the moon and 62 percent favor going to Mars. 85 percent feel its important the U.S. maintains new technology leadership, but only 56 percent agreed that the government should spend "whatever is necessary" to maintain leadership.

[Publication and date not noted by Code L (NY TIMES?). Posted on 19 March 1990]

"MAJOR FLAW FOUND IN SPACE STATION PLANNED BY NASA" By William J. Broad

"Federal experts have belatedly found that the \$30 billion space station Freedom, the planned centerpiece of the nation's program for the manned exploration of the solar system, cannot be built as designed because its vast array of parts would start to break down before the station was completed."

The problem, according to the TIMES, was uncovered by "NASA investigators early this year" and could force a redesigning of the station. As currently designed, the experts say the station would require an annual 2,200 hours of maintenance by space-suited astronauts. Only 400 hours of space walks have been accomplished in the 30 year history of the American space program. The TIMES says Space Station head Richard Kohrs termed an earlier 1,700 hour estimate absurd.

This most recent study, which is due to be completed in June, will include a set of recommendations which could range from building parts with longer lifespan (conceded as expensive); standardizing parts, increasing the construction pace, including development of a new heavy lift launch booster; and robotic maintenance. Most of these solutions, as reported by the TIMES, had significant problems associated with them.

Commenting on the situation, Federation of American Scientists' spokesman John E. Pike, said the finding was a serious blow to the program, but added, "Politically, it's not a death blow. The station is too big to cancel. They'll muddle through. There's no other choice." He also said, "The general lesson on this is the same as with the shuttle..., these things are easier to design and build than to operate."

It is the most complex spacecraft ever built, according to the TIMES. The story continues, enumerating the types and number of parts requiring maintenance and concluded with a recounting of the difficulty the Soviets are having with their Mir space station.

SPACE BUSINESS NEWS, MARCH 19
"CONGRESS TALKS TOUGH ON TDRSS"

"Lawmakers just don't understand why NASA wants to take as long to design a second generation satellite tracking system as it did to get to the moon."

The NEWS reports the House Science subcommittee on space requested another plan to "perpetuate its current Tracking and Data Relay Satellite System." Although "the bill (in discussion) was approved as it stands" without any changes in funding.

SPACE BUSINESS NEWS reports NASA "crafted the plan partly because delays in the space station pushed back the date by which the agency would like to have an Advanced TDRSS in orbit...and, commercial communications advances would be applied to ATDRSS at potential cost savings to the agency."

"The subcommittee, however, didn't want to allot money for another TDRS when NASA was asking them to fund the newer ATDRSS."

AEROSPACE DAILY, MARCH 20

"NASA CALLS EARLY ESTIMATES OF STATION EVA NEEDS 'PESSIMISTIC'"

"Preliminary estimates of the number of spacewalks needed to repair the Space Station during construction and operations are (quote) 'unrealistically pessimistic' and will decrease as the program develops, William B. Lenoir, associate administrator for space flight, said yesterday."

AVIATION WEEK reports Lenoir responded to a Monday New York Times article that "cited estimates of as many as 1,700 man-hours of extravehicular activity (EVA)...was the worst-case scenario."

Lenoir is quoted saying, "...the estimate (was) created for a study to be completed before the program preliminary design review in December." And, "...using it results in assigning unrealistically pessimistic values to hardware reliability." "Changes in hardware and systems to drive down EVA maintenance can be accommodated...without disrupting the schedule, cost or overall architecture of the program."

THE NEW YORK TIMES, MARCH 20

"NASA DEFENDS SPACE STATION BUILDING PLANS" By William J. Broad

"The space agency denied yesterday that unusually high maintenance and repair needs would jeopardize construction of the proposed \$30 billion space station Freedom."

The TIMES reports NASA said yesterday that "the maintenance and repair requirements were 'a normal part of doing business' and would not jeopardize station construction" and that the "internal study was unduly pessimistic and relied on a 'worst-case' scenario." The TIMES, however, said a "NASA expert familiar with the study said it was actually too optimistic" and that failure rates derived from "contractor figures that were pretty accurate".

The article also said NASA's rebuttal asserted that a minor redesign could reduce the maintenance problem "without disrupting the schedule, cost, or overall architecture of the program..." while the NASA expert said radical redesign was necessary.

House space subcommittee chairman Representative Bill Nelson termed the NASA study as troubling. He declared that the agency "had a history of being 'recalcitrant to do something about these operational costs,'" and noted space shuttle costs and complexity "turned out to be 'much greater than (sic) ever projected.'" A Congressional aide said the prospect "touched a raw nerve on Capital Hill because many members felt operational problems with the space shuttle had been underestimated.... 'We don't want to get burned twice.'" quotes the TIMES.

ASSOCIATED PRESS -- MARCH 25

By Harry F. Rosenthal

"The authors of a controversial study estimating huge maintenance requirements for the space station stuck to their guns Friday but said the estimate was only preliminary."

"In their study, Dr. William Fisher, an astronaut and physician, and NASA engineer Charles R. Price said the station as now conceived would require 2,284 hours of maintenance each year by astronauts working in space."

AP reports "astronauts generally have not spent more than six hours at a time working in...space." And, reports that Lenoir says the study "would require an average of 3.7 space walks a week." However, AP says he "prefers no more than one a month."

Fisher also is quoted, "The function of the next four months is to take piece-by-piece the components of this number and see how much it's real and ...how much we can cut down..."

AP reports the space station is undergoing final design reviews and a preliminary data reports the "measurements were not to be taken as exact...it's just a snapshot." And, this "is not an engineering problem...engineering is what NASA does better than anything in the world," said Fisher.

LOS ANGELES TIMES, MARCH 27

"AS SPACE STATION PREPARES TO GO UP, FEARS GROW ABOUT IT COMING DOWN" By Edwin Chen

"When things go NASA's way, what goes up doesn't necessarily come back down. With scores of satellites uneventfully orbiting Earth, the space agency's track record is hard to assail. Yet when things go wrong, the failures can be spectacular."

"During the 77 ton Skylab's fiery plunge in 1979, there was massive hand-wringing around the world. Luckily, the debris fell harmlessly into the Indian Ocean and Australia's outback."

The TIMES reports "two recent reports spotlight" the possibility of the space station running "out of the fuel it needs to maintain orbit, thus falling back to Earth."

"In a controlled re-entry, NASA said, the space station could be steered on a course of descent that would minimize any 'resulting footprint...at a random location.'"

The TIMES reports "when fully deployed...the space station will (be)...almost four times as large as Skylab, which fell in 1979." And, lists in a NASA environmental impact statement possible causes for the space station or components to fall. It concludes saying "each scenario is 'highly unlikely,' NASA said."

The TIMES reports the Department of Transportation requested the "odds of a...Challenger-like tragedy...recurrence, and the space agency came up with a worst-case scenario of one explosion in every 78 launches and a best-case scenario of one in 200."

John Pike, associate director for space policy at the Washington-based Federation of American Scientists is quoted "based on these projections...that would put it (the next accident) in the early next century."

The TIMES reports such an explosion may ground the shuttle program, accenting the risk of possible solar power panel problems in the space station and other component break downs. Without a shuttle to provide timely repairs or replacement before the station is fully assembled, the concern would be a result in the debris falling to earth.

"Mark Hess, a NASA space station spokesman, warned against automatically assuming that the shuttle fleet would be grounded for extended time periods..."

The TIMES reports Doyle McDonald, a NASA spacecraft engineer who directed the environmental impact statement suggested "precise calculations should be deferred until the space station's final design and configuration are known."

THE NEW YORK TIME, MARCH 27

"WANTED ON THE SPACE STATION: BETTER SUITS, ROBOTS AND PARTS" By William J. Broad

"Futuristic projects that the space agency once pursued half-heartedly are now soaring to prominence as NASA struggles to cope with a threat to the success of the proposed \$30 billion space station Freedom, the centerpiece of the nation's program for the manned exploration of the solar system."

"Staggered by new estimates of more complex and extensive space station repair work than originally estimated, NASA is scrambling to find solutions", reports the TIMES. Accelerating work on new space suits to simplify space walks, creating advanced robots to do some of the work and improving the endurance of station parts are some of the solutions being weighed.

Congress is scheduled to address the problem at three hearings today in which astronaut William F. Fisher, and robotics engineer Charles R. Price, both leaders of a special NASA team on the subject, are expected to testify that the issue is open to solution. The TIMES quotes Fisher, "This is an engineering problem, ... Engineering is what NASA does better than anything in the world."

The article continues, outlining the hazards of the space environment, current space suit constraints on work and new designs that NASA Ames's William E. Berry says could easily be ready for station use.

Robots may eventually shoulder from 50 to 70 percent of the maintenance load, hopes NASA Goddard's Dr. David E. Provost, a figure that may depend on station design.

* * * * *

THE CHRISTIAN SCIENCE MONITOR, MARCH 27 (EDITORIAL)

"Major flaws are suspected in the design of the proposed U.S. space Station Freedom. If a 12 member NASA oversight panel is correct, a redesign of the space station, and perhaps of U.S. space priorities, could be needed."

"But preliminary findings may not be accurate. The NASA team charged with designing the station ought to be given the benefit of the doubt. They are men of talent and experience."

The MONITOR'S EDITORIAL comments "perhaps it is time to explore the unmanned 'Shuttle C' option, which could deliver a space station in four or five trips. Or, perhaps the heavy-lift rocket..shouldn't be canceled."

"Manned space trips can be apple-pie politics...If the basic problems...can't be solved without monstrous expenditures of time and money, the space program's direction should be reconsidered."

THE NEW YORK TIMES, MARCH 28

"HOPE IS HELD OUT ON SPACE STATION PROBLEMS" By William J. Broad

"The leaders of a study who said a proposed \$30 billion space station would require prohibitive maintenance told Congress today that they felt NASA had solutions available. But they said the agency needed to act quickly."

Study leader, Dr. William F. Fisher, an astronaut, testified that advanced robots, new space suits and redesigned parts for maintenance were possible solutions if the problem is tackled quickly, the TIMES reported. Fisher said the final assessment will probably be higher than he would like, but the problem "was 'not a show stopper.'"

NASA Associate Administrator for Space Flight William B. Lenoir praised the team's work though NASA officials last week "dismissed the study as a 'worst-case scenario.'" Lenoir termed the study as part of a normal engineering process to identify weak points in a design.

Fisher emphasized that the station's complexity made maintenance figures hard to pin down. Said Fisher, "It's the first time anything of this magnitude has been attempted by the human race."

The article reviewed preliminary reports on the problem and pointed out that it comes to light as Congress is reviewing NASA's proposed \$15.2 billion budget for next year which includes a 24 percent or \$2.9 billion increase.

AEROSPACE DAILY, MARCH 30

"'SKUNK WORKS' APPROACH WON'T WORK FOR HP SPACE SUIT: LENOIR"

"A high pressure space suit that could reduce the time spent preparing for work outside the Space Station cannot be developed using a low cost, 'Skunk Works' approach, William B. Lenoir, NASA associate administrator for space flight, said yesterday."

The DAILY reports a high pressure suit could be built for about \$85 million, according to a Boeing Aerospace study, using a 'Skunk Works' small team, low cost approach. The story added that Lockheed had "developed the Skunk Works in Burbank, California to build the SR-71, U-2 and F-117."

"Lenoir told a Senate subcommittee he didn't know how Boeing developed the cost estimate. The NASA official said suit designs must undergo extensive and expensive testing before they are used by astronauts... 'there are no short cuts...a skunk approach cannot work, you need eyes and more eyes and more eyes to look at (the design).'"

NEW YORK TIMES, APRIL 3

"BUSH OPEN TO SPACE VOYAGES WITH SOVIET UNION"

"President Bush has embraced the idea of cooperating with the Soviet Union in the manned exploration of the solar system, including voyages to the Moon and Mars, White House officials said yesterday."

The TIMES reports the President plans seeking an "exploratory dialogue" with the Soviet Union, Europe, Canada, Japan and other countries on the possibility of international cooperation in the Space Exploration Initiative.

Boris Malakhov, a Soviet Embassy spokesman said his country was "very positive."

The White House statement is reported saying "The exploratory dialogue will focus solely on conceptual possibilities for cooperation."

Also, the White House official is reported saying "that nothing has been ruled out in the spectrum of cooperation ranging from full partnership to token representative." And, the TIMES reports, the National Space Council, headed by Vice President Dan Quayle, would develop guidelines.

The TIMES reports during the 20th anniversary of the manned lunar landing, the President's goals to the Moon and Mars discussed a "'feasibility of international cooperation,' but made no commitment to the idea."

OBJECTIVE

TO IDENTIFY THE SPACE STATION-RELATED ROLES OF ALL OSSA ORGANIZATIONAL ELEMENTS AND THEIR SUPPORTING FIELD CENTER ORGANIZATIONS AS WELL AS OSSA INTERFACES AT ALL LEVELS WITH THE SPACE STATION FREEDOM PROGRAM. IN ADDITION, THE PLAN WILL DEFINE THE SCOPE OF ACTIVITIES LEADING TO OPERATIONS ON SPACE STATION FREEDOM.

CONTENTS

1. INTRODUCTION
2. IMPLEMENTATION STRUCTURE AND CONCEPTS
3. OSSA SPACE STATION ORGANIZATION
4. DISCIPLINE DIVISION ROLES IN SPACE STATION UTILIZATION AT HEADQUARTERS LEVEL
5. MANAGEMENT AND SYSTEMS INTEGRATION AT HEADQUARTERS LEVEL
6. IMPLEMENTATION FUNCTIONS AT FIELD CENTER LEVEL
7. SCIENCE COORDINATION WITH OTHER ORGANIZATIONS
8. MANAGEMENT INTERFACES TO THE SPACE STATION FREEDOM ORGANIZATION
9. PLANNING SCHEDULE
10. EVOLUTIONARY STRATEGIES

APPENDICES

- A. ABBREVIATIONS
- B. BIBLIOGRAPHY
- C. OSSA SPACE STATION FREEDOM UTILIZATION MANAGEMENT OVERVIEW
- D. OSSA PAYLOADS
- E. LETTERS OF AGREEMENT (CODE E & CODE S; CODE E/CODE S/CODE T)
- F. MEMORANDA OF AGREEMENT BETWEEN FSD AND DISCIPLINE DIVISIONS
- G. DISCIPLINE MOUs WITH SCIENCE PARTNERS

**OSSA FIELD CENTER FUNCTIONAL RESPONSIBILITY MATRIX
ATTACHED PAYLOAD DEVELOPMENT/INTEGRATION/OPERATIONS**

INTEGRATION FUNCTIONS >>	SUM/INTERFACE COORDINATION		ANALYTICAL INTEGRATION		PHYSICAL INTEGRATION				OPERATIONS (1)		INVESTIGATOR/ INSTITUTION	DEVELOPMENT CENTER
	DD	FSD	DD	FSD	DD	FSD	DD	FSD	DD	FSD		
RESPONSIBLE OSSA ORGANIZATION >>	DD	FSD	DD	FSD	DD	FSD	DD	FSD	DD	FSD		
EOS • CERES • SAGE III • LIS	EE	MSFC		MSFC		KSC		KSC		MSFC	BARKSTROM/ARC McCORMICK/LARC CHRISTIAN/MSFC	GSFC (EOS PO)
LCT	EC	JSC		JSC		KSC		KSC	GSFC (2)		FITZMAURICE/GSFC	GSFC
CDCF • CODE • EXO-ICE • CDOCE	EL (FAC) EL EB EL	JSC		JSC		KSC		KSC	JSC (2)		WALKER/WASH. U CARLE/ARC AUER/ APPLIED RES	JSC
ASTROMAG • WIZARD • LISA • SCIN (MAGIC)	ES (FAC) ES ES ES	MSFC		MSFC		KSC		KSC	GSFC (2)		GOLDEN/N. MEX. ST. ORMES/GSFC PARNELL/MSFC	GSFC/ITALY GSFC GSFC GSFC
HNC	ES	MSFC		MSFC		KSC		KSC		MSFC	PRICE/U. OF C.	MSFC
UHRXS	ES	MSFC		MSFC		KSC		KSC		MSFC	WALKER/STANFORD	MSFC
LAMAR	EZ	MSFC		MSFC		KSC		KSC		MSFC	GOENSTEIN/SAO	MSFC
XBSS	EZ	MSFC		MSFC		KSC		KSC		MSFC	SANDERS/U. OF WIS.	MSFC
SARR	--	JSC		JSC		KSC		KSC	JSC (2)		TBD	JSC

NOTES: (1) FOR POP 90-1 BUDGET ESTIMATES
(2) ASSUMPTION

DEFINITIONS: FSD - FLIGHT SYSTEMS DIVISION
DD - DISCIPLINE DIVISION

K	PAYLOAD DEVELOPMENT
E	PAYLOAD INTEGRATION/
Y	OPERATIONS

SUM 3/5/90

**OSSA FIELD CENTER FUNCTIONAL RESPONSIBILITY MATRIX
PRESSURIZED PAYLOAD DEVELOPMENT/INTEGRATION/OPERATIONS**

INTEGRATION FUNCTIONS >>	SUM/INTERFACE COORDINATION		ANALYTICAL INTEGRATION		PHYSICAL INTEGRATION				OPERATIONS (1)		INVESTIGATOR/ INSTITUTION	DEVELOPMENT CENTER
	DD	FSD	DD	FSD	DD	FSD	DD	FSD	DD	FSD		
RESPONSIBLE OSSA ORGANIZATION >>	DD	FSD	DD	FSD	DD	FSD	DD	FSD	DD	FSD		
LIFE SCIENCE												
• CENTRIFUGE FAC.	EB	JSC	ARC		ARC			KSC	ARC			ARC
• GRAVITATIONAL BIO.	EB	JSC	ARC		ARC			KSC	ARC			ARC
• SPACE PHYSIOLOGY	EB	JSC	JSC		JSC			KSC	JSC		TBD	JSC
• EXOBIOLOGY	EB	JSC	ARC		ARC			KSC	ARC			ARC
• CELSS	EB	JSC	ARC		ARC			KSC	ARC			ARC
MICROGRAVITY												
• APCGF	EN	MSFC	MSFC		MSFC			KSC		MSFC		MSFC
• BTF	EN	MSFC	JSC		JSC			KSC	JSC			JSC
• MCPF	EN	MSFC	JPL		JPL			KSC	JPL		TBD	JPL
• MCF	EN	MSFC	LeRC		LeRC			KSC	LeRC			LeRC
• FPDF	EN	MSFC	LeRC		LeRC			KSC	LeRC			LeRC
• SSFF	EN	MSFC	MSFC		MSFC			KSC		MSFC		MSFC
SARR	--	JSC		JSC		KSC		KSC	JSC		TBD	JSC

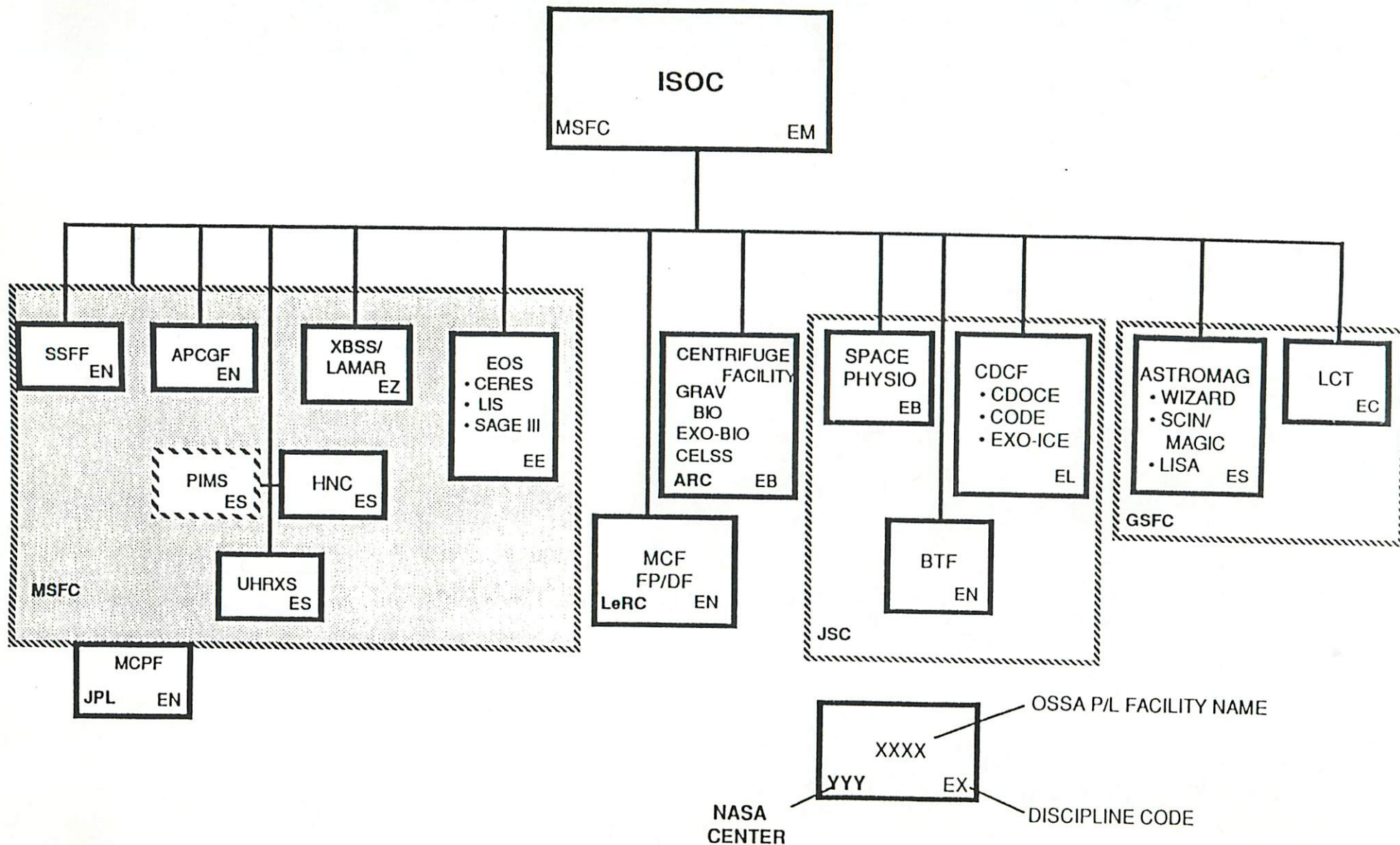
NOTES: (1) FOR POP 90-1 BUDGET ESTIMATES

DEFINITIONS: FSD - FLIGHT SYSTEMS DIVISION
DD - DISCIPLINE DIVISION

K	PAYLOAD DEVELOPMENT
E	PAYLOAD INTEGRATION/
Y	OPERATIONS

SUM 3/5/90

PAYLOAD OPERATIONS ASSIGNMENTS TO NASA CENTERS



OFFICE OF SPACE AND APPLICATIONS
FORMAL ROLES AND RESPONSIBILITIES FOR ATTACHED PAYLOADS ON SPACE STATION FREEDOM

ORGANIZATION		DEFINITION & DEVELOPMENT		ANALYTICAL INTEGRATION		PHYSICAL INTEGRATION			ON-ORBIT OPERATIONS
		PHASE A/B	PHASE C/D	PAYLOAD	STATION	PAYLOAD TO CARRIER	INTEG. P/L TO STATION SYSTEMS (INTERFACE VERIF. & TEST)	LAUNCH PKG TO NSTS	
O S S A	PRINCIPLE INVESTIGATOR	REVIEW AND APPROVAL	REVIEW	REVIEW	REVIEW	REALTIME SUPPORT	ON-CALL	ON-CALL	REALTIME INSTR. OPS. & EVALUATION
	EXPERIMENT CENTER	PRIME	PRIME	REVIEW	REVIEW	ON-SITE TECHNICAL SUPPORT	TECHNICAL SUPPORT	TECHNICAL SUPPORT	REALTIME TECHNICAL SUPPORT
	FACILITY DEV. CENTER (AS REQUIRED)	REVIEW	REVIEW	PRIME *	REVIEW	ON-SITE TECHNICAL SUPPORT	TECHNICAL SUPPORT	TECHNICAL SUPPORT	REALTIME TECHNICAL SUPPORT
	SCIENCE UTILIZATION MANAGEMENT	REVIEW	REVIEW	PRIME **	REVIEW ***	PRIME (AT KSC)	ON-SITE TECHNICAL SUPPORT	ON-SITE TECHNICAL SUPPORT	PRIME (ISOC)
N O N I O S S A	SSFP (CODE S)	N/A	REVIEW	REVIEW	PRIME	REVIEW	PRIME	ON-SITE TECHNICAL SUPPORT	PRIME (POIC & STATION)
	NSTS (CODE M)	N/A	REVIEW	REVIEW	REVIEW	REVIEW	ON-SITE TECHNICAL SUPPORT	PRIME	INITIAL HARDWARE TRANSPORT

* RESPONSIBLE FOR ANALYTICAL INTEGRATION OF FACILITY INSTRUMENTS

** RESPONSIBLE FOR ANALYTICAL INTEGRATION OF PI CLASS INSTRUMENTS AND INTEGRATED FACILITIES TO SPACE STATION INTERFACES

*** SUM TEAM DEVELOPS INTEGRATED ANALYSES FOR ALL OSSA PAYLOADS FOR INPUT TO SSFP;
SPACE STATION RESPONSIBLE FOR INTEGRATING ALL USERS AT THE ELEMENT AND MANNED BASE LEVEL

JA-15,664-90C11

OFFICE OF SPACE AND APPLICATIONS
FORMAL ROLES AND RESPONSIBILITIES FOR PRESSURIZED PAYLOADS ON SPACE STATION FREEDOM

ORGANIZATION		DEFINITION & DEVELOPMENT		ANALYTICAL INTEGRATION		PHYSICAL INTEGRATION			ON-ORBIT OPERATIONS
		PHASE A/B	PHASE C/D	PAYLOAD	STATION	PAYLOAD TO RACKS	P/L TO STATION SYSTEMS (INTERFACE VERIF. & TEST)	LOG MODULE TO NSTS	
O S S A	PRINCIPLE INVESTIGATOR	REVIEW AND APPROVAL	REVIEW	REVIEW	REVIEW	REALTIME SUPPORT	ON-CALL	ON-CALL	REALTIME INSTR. OPS. & EVALUATION
	FACILITY DEV. CENTER	PRIME	PRIME	PRIME *	REVIEW	PRIME (AT VARIOUS SITES)	TECHNICAL SUPPORT	TECHNICAL SUPPORT	REALTIME TECHNICAL SUPPORT
	SCIENCE UTILIZATION MANAGEMENT	REVIEW	REVIEW	PRIME **	REVIEW ***	ON-SITE TECHNICAL SUPPORT	ON-SITE TECHNICAL SUPPORT	ON-SITE TECHNICAL SUPPORT	PRIME (ISOC)
N O N I O S S A	SSFP (CODE S)	N/A	REVIEW	REVIEW	PRIME	REVIEW	PRIME	ON-SITE TECHNICAL SUPPORT	PRIME (POIC & STATION)
	NSTS (CODE M)	N/A	REVIEW	REVIEW	REVIEW	REVIEW	ON-SITE TECHNICAL SUPPORT	PRIME	INITIAL HARDWARE TRANSPORT

* RESPONSIBLE FOR ANALYTICAL INTEGRATION OF FACILITIES

** RESPONSIBLE FOR ANALYTICAL INTEGRATION OF PI CLASS INSTRUMENTS AND INTEGRATED FACILITIES TO SPACE STATION INTERFACES

*** SUM TEAM DEVELOPS INTEGRATED ANALYSES FOR ALL OSSA PAYLOADS FOR INPUT TO SSFP;
SPACE STATION RESPONSIBLE FOR INTEGRATING ALL USERS AT THE ELEMENT AND MANNED BASE LEVEL

JA-15,670-90C11

CODE E

LSE/GLSF Demand Model Matrix

SUPPORT EQUIPMENT	FACILITIES									
	SPACE STATION FUNGUS FACILITY R. Chassigny/MSFC	ADVANCED PROTEIN CRYSTAL GROWTH R. Chassigny/MSFC	MODULAR COMBUSTION FACILITY R. Chassigny/LERC	FLUID PHYSICS/FLUID DYNAMICS FACILITY R. Chassigny/LERC	MODULAR CONTAINERLESS PROCESSING R. Grummi/JPL	BIOTECHNOLOGY FACILITY S. Gordon/JSC	CELLS C. Straight/WARC	GAS GRAIN SIMULATION FACILITY J. Huntington/WARC	CENTRIFUGE/GRAVITATIONAL BIOLOGY E. Bauer/WARC	SPACE PHYSIOLOGY FACILITY C. Moody/JSC
STATION-PROVIDED CORE LSE										
BATTERY CHARGER										
CAMERA										
CAMERA LOCKER										
CLEANING EQUIPMENT										
DIGITAL MULTIMETER										
DIGITAL RECORDING SCOPE										
DIGITAL THERMOMETER										
DOSIMETER PASSIVE										
EM SHIELDED LOCKER										
ELECTRODE IMPEDANCE METER										
FILM LOCKER										
FLUID HANDLING TOOLS										
FREEZE DRIER										
FREEZER -20° C										
FREEZER -70° C										
FREEZER CRYOGENIC										
GENERAL PURPOSE HAND TOOLS										
MASS MEASUREMENT DEVICE (MICRO)										
MASS MEASUREMENT DEVICE (SMALL)										
PH METER										
PORTABLE GLOVEBOX										
REFRIGERATOR										
SPECIMEN LABELING DEVICE										
USER-PROVIDED LSE										
AUTOCLAVE										
CENTRIFUGE REFRIGERATED										
CUTTER/POLISHING SYSTEM										
ELECTRICAL CONDUCTIVITY PROBE										
EQUIPMENT WASHER/SANITIZER										
ETCHING EQUIPMENT										
GAS CHROMATOGRAPH/MASS SPECT										
HALL PROBE										
HP LIQUID (ION) CHROMATOGRAPH										
INCUBATOR										
MICROSCOPE ELECTRON SCANNING										
MICROSCOPE SYSTEM										
MICROTOME										
OPTICAL PYROMETER										
SPECTROPHOTOMETER UV/VIS/NIR										
SURGERY DISSECTION TOOLS										
ULTRASONIC IMAGING SYSTEM										
UV STERILIZATION UNIT										
X-RAY SYSTEM										
GENERAL LABORATORY SUPPORT FACILITIES										
LABORATORY SCIENCES WORKBENCH										
MATERIALS WORKBENCH										
LIFE SCIENCES GLOVEBOX										
MATERIALS PROCESSING GLOVEBOX										

- 1 - MANDATORY - EXPERIMENT CANNOT OPERATE WITH OUT THIS LSE ITEM
- 2 - REQUIRED - EXPERIMENT WILL BE CONSTRAINED, BUT LSE ITEM AVAILABILITY SHOULD NOT AFFECT MANIFESTING
- 3 - POST ASSEMBLY REQUIRED - REQUIRED AFTER SPACE STATION ASSEMBLY COMPLETION FOR UNCONSTRAINED OPERATION
- NOT REQUIRED - LSE ITEM CURRENTLY NOT REQUIRED FOR EXPERIMENT COMPLETION*

* THE ABSENCE OF ANY INDICATION FOR AN ITEM QUALIFIED THAT ITEM AS "NOT REQUIRED" FOR THAT RESPONSE.

OFFICIAL CODE E FACILITY DEVELOPERS PER P. CRESSY'S LETTER DATED FEBRUARY 15, 1990.

GLSF, THE PORTABLE GLOVEBOX, AND THE ELECTRODE IMPEDANCE METER ARE ITEMS NOT INCLUDED IN THE SUM LSE QUESTIONNAIRE. THE FILM AND EM-SHIELDED LOCKERS NOW REPLACE THE RADIATION SHIELDED LOCKER.

Early Statistics

General

- 30 documents in Datapak, 3 documents issued at the Oral Summary Presentations. All "RIDable".
- 2 Errata documents, 1 USE "White Paper" issued at the Oral Summary Presentations. Not "RIDable".
- 7 CSCIs (Computer Software Critical Items) covered in DMS PDR #2.
 1. DSAR (Data Storage and Retrieval)
 2. MODBM (Master Object Database Manager)
 3. NOS (Network Operating System)
 4. OS/Ada RTE (Operating System/Ada Run Time Environment)
 5. System Management (SM)
 6. STSV (Standard Services)
 7. USE (User Support Services)
- 300-352 people attended the 3-day DMS PDR #2 Oral Summary Presentations at IBM-HOU (2/6-8/90).
- Total number of RIDs believe to be around 3000 (2502).
- 9 RID Review Teams at MDSSC-HOU (25 - 30 people supporting each Team)
 1. Systems - NASA Team Leader JSC/EH/Virginia Whitelaw
 2. Design Support - NASA Team Leader JSC/KG/Thad Putnam
 3. Master Object Database (MODB) - NASA Team Leader JSC/KG/Fay Bryan
 4. System Management/Network Operating System (SM/NOS) - NASA Team Leader JSC/EH/Larry Abbot
 5. User Support Environment (USE) - NASA Team Leader JSC/FR/Joe Snyder
 6. Operating System/Ada Run Time Environment (OS/Ada RTE) - NASA Team Leader JSC/FR/Jim Forehand

(PRIME - 12)

General (Concluded).

7. Standard Services (STSV) - NASA Team Leader JSC/FR/Bill Dwyer
 8. Test - NASA Team Leader JSC/KG/Marion Pringle
 9. RID Integration - NASA Team Leader JSC/KG/Walt Marker
- JSC SUM (2 people) attempted to randomly cover 9 Teams for 2 weeks.
 - JSC SUM (1 person) supported RID Resolution Board (RRB) for 1 week.

OSSA/SUM RIDs

- 43 OSSA/SUM RIDs (MSFC-24, JSC-19) received at JSC SUM (W. Eaton) on 2/8-9/90.
- 30 OSSA/SUM RIDs survived the OSSA/SUM RID Telecon on 2/12/90.
- 30 OSSA/SUM approved RIDs delivered to WP02 RID Control Center (MDSSC-HOU) on 2/12/90 at COB.
- 22 JSC/SE2 (Life Sciences) and SE3 (Cosmic Dust Collection Facility) RIDs placed under the JSC SUM umbrella on 2/16/90.
- 46 JSC/SE2 & SE3 RIDs placed under JSC SUM umbrella on 2/26/90.
- JSC OSSA/SUM WP02 PDR RID Coordinating/Tracking Team (JO/SW2PRC/TT) currently tracking 98 OSSA/SUM RIDs.

(PRIME - 13)

R. Cassingham


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-498

9 April 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Utilization Team Minutes for 9 April 1990

PRESENT: Rob Staehle, Randy Cassingham, Lori Paul, Sima Lisman, Chuck Ivie, Richard Grumm, Hershal Fitzhugh, Bing Chen, Kristan Lattu, Paul Henry, Jeff L. Smith, Chi Lin

Next Meeting: 16 April 1990 at 10:30 in 301-271

Rob Staehle

Mark Albrecht, the Executive Secretary of the National Space Council, spoke at the Southern California Space Business Roundtable meeting last week. Rob gave him a copy of Paul Henry's just-released *Mars Exploration Mission Design Data Book*. Lou Friedman also wants a copy.

Two VAPEPS (JPL Vibroacoustic Payload Environment Prediction System) workshops will be held in Pasadena: one from May 8-10, the other from May 15-17. The workshops are being held "to provide members of the space payload community with an overview of the capabilities of the VAPEPS program and functions of the JPL VAPEPS Management Center." Rob has a copy of the brochure.

Code MT's POP 90-1 call was announced on January 25, but nothing has been heard of it since. Was it released? Is 90-2 out yet? Lori Paul to follow up.

Jack Schmid of Code LPS, NASA HQ's Public Affairs Office, is soliciting Station-literate volunteers to work two weekends (Fri-Sun May 4-6 and Sat-Sun May 12-13) at the Air-Space America show in San Diego. The volunteers will answer questions at a Space Station module walk-through mockup. Arrangements would be made to reimburse for time and travel. Anyone interested in participating should contact Rob.

Mike Devirian was here last Wednesday to discuss the Communications and Tracking audit plan and his need for support from Division 33 (and, possibly, Divisions 31 and 36). Rob and Jeff L. Smith are coordinating this. The audit is a top priority in the JSO charter.

The long-awaited *Project Solar Sail* book, edited by Arthur C. Clarke, which will help in funding the World Space Foundation's Solar Sail Project, has been published as a paperback and is in bookstores.

Randy Cassingham

Paul's *Mars Exploration Mission Design Data Book* is off the press and distributed. Distribution was limited: it is a large volume regarding Mars trajectory planning (with the requisite multitude of "pork chop" plots...) -- anyone that didn't get a copy but really wants one should contact Randy. The volume covers Mars-Earth and Earth-Mars opportunities, with and without Venus flybys, from 2015-2026.

Sima Lisman

Joe Sullivan/SSEIC is meeting with Dick Williams/Level II to express his support for the Disturbance Simulation and Management Tool.

Chuck Ivie

Chuck is travelling to JSC next week to attend the OMA (Operations Management Applications) PDR (the OMA is the software side of the OMS -- the Operations Management System). He spent some time talking with Jeff H. Smith/311 about the implications EVA and Robotics have on the OMS -- some significant issues were raised that need looking into. Jeff L. Smith is quite interested in the results of the OMA meeting; Chuck will brief the FROST team on its results at FROST's April 27th meeting.

It is not clear that the facilities planned for early assembly phase will be able to support the scheduled activities. For instance, because there is a lack of power for the first few assembly flights, there will be no power available to support payloads, *and no uplink or downlink data even if there are self-supporting payloads on board*. Paul Henry's stand-alone kit concept may come in very handy here -- it could support a modest communications system to keep track of the Station in these early days. Chuck finds the Kit a very neat and timely solution, and will bring it up at the OMA meeting. Rob suggested that Chuck, Paul Henry and Andy Bennett have a telecon to talk more about the Kit's capabilities in this area, especially as it relates to frequency allocation issues (SAK to C&T, SAK to ground around C&T, etc.)

There was also some discussion of EVA: EVA time estimates from the "Fisher/Price" study may not be a "worst case" scenario, but a reasonable estimate. As has been reported in the trade press, the worst case could be far worse. With EVA costing on the order of \$200,000 an hour (and only baselined for one per month), robotics might be a mandatory alternative for at least some EVA tasks. Chuck is looking further into this issue. Jeff L. Smith discussed the present baseline for EVA as represented in the SDTM (the System Design Tradeoff Model) software.

Chuck received a load of output from the Information System Strategic Planning Project (ISSPP) -- a Code E/T exercise to look at future information systems. He sent it on to JSO; it looks like it would be of help in the rewrite of the PDRD Section 7 (EECS).

Dick Grumm

Dick solicited help from the group to solve a problem regarding solar pointing. A payload has an interest in a solar furnace; what's the best way to keep it properly pointing at the sun? Paul Henry and Bing Chen offered to lend a hand.

Jeff L. Smith

Richard Beatty was here last week to coordinate the ESA "Spring Fling", a meeting here for a week to discuss mutual End-to-End Communications System concerns. It is again on schedule for the third week of May.

SDTM will be holding a three-day training course at Caltech next week (Tuesday though Thursday). There *may* be a few openings left (out-of-towners will have priority). Anyone interested in filling an empty seat should contact Jeff as soon as possible. MESSOC (the Method for Estimating Space Station Operations Costs, a subset of SDTM that is also available as a stand-alone program) will also be discussed.

Hershal Fitzhugh

Fitz attended the Code E Attached Payload Workshop last week. There were some very interesting presentations, some items noted would also apply to pressurized payloads. Among the more interesting items:

- A draft MROFE (the *Mission Requirements on Payloads/Facilities/Experiments* document) for the Space Station should be out (from MSFC) in about one year. It was noted that all payloads should get detailed payload information into the MROFE *four years* before flight -- a

potential problem since many payload developers won't have the detailed information and funding required so long before flight.

- All attached payloads should be designed for A&R installation -- but there were big gaps in the A&R operations plans presented (such as how to hand the payload over from one robot to the next, implying two (different?) robotic attach points).
- Attached payloads should provide covers to protect sensitive components from contamination.
- Per the Space Station, payloads will be in the STS cargo bay for *four to seven days* prior to being unloaded for installation -- presumably a time spent without power. The Space Station office also said that payloads may be cut off from power *for periods of up to four weeks at a time*, presumably with little warning.
- The current Station altitude minimum and maximum is 180 and 240 nautical miles (the minimum assumes a missed resupply flight).
- An interesting contamination presentation was given by Martha Torr/MSFC. Included many interesting photographs from STS flights (e.g., plasma glow, urea clouds).
- The next presentation was also on contamination: there are presently nine different documents with contamination information that payload developers would have to take into account, and there might be nine sets of documents required from payload developers detailing how they have taken into account each of the nine documents. Fitz suggested to Gary Wicks/MSFC (the Science Utilization Management working group chair) that the nine documents be condensed into a single, comprehensive, workable document tailored for users.
- In a splinter group session, a payload developer asked if a Space Station thermal model would be supplied so that developers could check their systems out. (Payload developers are also concerned that, with the lack of Station-provided thermal control, the many individual payload-mounted thermal panels will cause a field-of-view problem for other payloads and their radiators.)
- Fitz had been scheduled to give a presentation on payload classification, but this issue is up in the air as Code Q and others sort out what is going on. They asked Fitz that he hold back on presenting the detailed information that he had. Instead, he presented a brief overview using Code E Headquarters charts.

In other matters, Fitz has received some interesting drawings:

- Several drawings of the Station Interface Adapter
- Two views (top and front) of the Station's field-of-view impingement areas as of flight 28 (see attached).

Bing Chen and Kristan Lattu

Bing and Kristan are supporting the SED RIGs -- the Support Equipment Development Requirements Integration Groups -- as part of their LSE (Laboratory Support Equipment) support. There are four RIGs (one for each of the four types of LSE: Life Science, Microgravity, General Support Laboratory Facilities, and Preservation & Storage). The RIGs will each hold two telecons this month to clarify design issues, consolidate initial comments, identify new issues, identify issues requiring conflict resolution, resolve conflicts, and formally submit their comments. Bing and/or Kristan will participate, using information from Gene Trinh regarding MCPF needs.

Paul Henry

The Evolution Working Group now has funding ("transition definition" received \$9M of \$12M requested; of this \$3.8M is for system studies, with more possibly to come). There are some organization changes in the transition definition area, with Karen Brender moving from Evolutionary Operations to Integration, and George Ganoe taking Karen's place. The EWG met last week at JSC; Paul and Jeff H. Smith took an action item (as did everyone) to write a brief on issues that PDR participants should look out for. Richard Beatty/JSO gave an excellent overview of the PDR process. Participation in the PDR was the main topic, but Barry Meredith/LaRC is concerned that the EWG's comments will have little impact on the Station's plans for hooks and scars.

Chi Lin

Chi Lin/366 gave a presentation to the meeting on her Software Project Simulation software tool. The tool, which is at its prototype stage, is designed to support management in the identification of optimal sets of strategies to deal with given scenarios to achieved predefined project goals. It

- enables contingency planning and cost estimates
- helps avoid software project cost and schedule overruns
- reduces risk by detecting adverse decisions.

Funding for her task ends this year. She is looking for a new sponsor to continue the work. She has spoken with Gregg Switek/MT and Jim Raney/JSC with the Software Support Environment. Rob indicated that support from JSO was unlikely, but agreed to seek an audience for her with appropriate JSO personnel.

Upcoming Meetings

April 16-21: DMS Operations Management Applications PDR in Houston. Chuck Ivie to attend.

May 14-15: UDAWG meeting at MSFC. Paul Henry and Hershal Fitzhugh to attend.

May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

June 3-6: Case For Mars symposium in Boulder. Rob Staehle to attend.

June 20-22: First International Symposium on Measurement and Control in Robotics at JSC. No one yet slated to attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

SPACE BUSINESS NEWS, APRIL 2

"NASA TRIES TO REPAIR CREDIBILITY WITH CONGRESS"

"NASA is touting advanced robotics as the solution to many of its space station problems in hopes this will bring more money to the space program."

"Representative Bob Traxler, D-Michigan, whose House Appropriations subcommittee on HUD-independent agencies most consistently pegs the NASA budget, says NASA will be lucky to get a 15% hike over last year's spending. That would mean a \$1.1 billion cut in a budget NASA swears is so tight it squeaks."

SPACE BUSINESS NEWS reports Traxler must "sell the agency's budget to a body that feels misled" with regard to the space station program budget. Due to "allegations" in articles published by the New York Times March 19 and 21, concerns arose with "vital parts of the space station" that would fail before the project was completed.

The NEWS article says a NASA "investigative team" report "published while NASA faced Traxler's subcommittee, agency officials found themselves on the defensive" creating a possible "loss of credibility due to the articles' implication that NASA has something to hide."

As a result, Traxler considered the possibility of robotics a "gimmick" and questioned the maintenance estimate as well as proposals to European participants regarding a previous plan to provide 75kW of power to users that is now 30kW.

However, Bill Lenoir, the associate administrator for space flight, quoted the estimated 2,200 EVA maintenance hours as a "worst-case scenario" saying the TIMES articles "'blew them out of proportion to what the reality of the situation is.'"

Also, the NEWS reports the TIMES articles regarded "flaws" in the space station required the development of an "investigative team." Administrator Truly said the development of the team was because "officials want the project to move along as quickly and safely as possible."

Lenoir said as the process continues, such teams are "business as usual." Saying these developments are an "engineering challenge," he "cited past NASA results, such as the tile problems in the space shuttle program, that had seemed insurmountable but had been solved without going over budget."

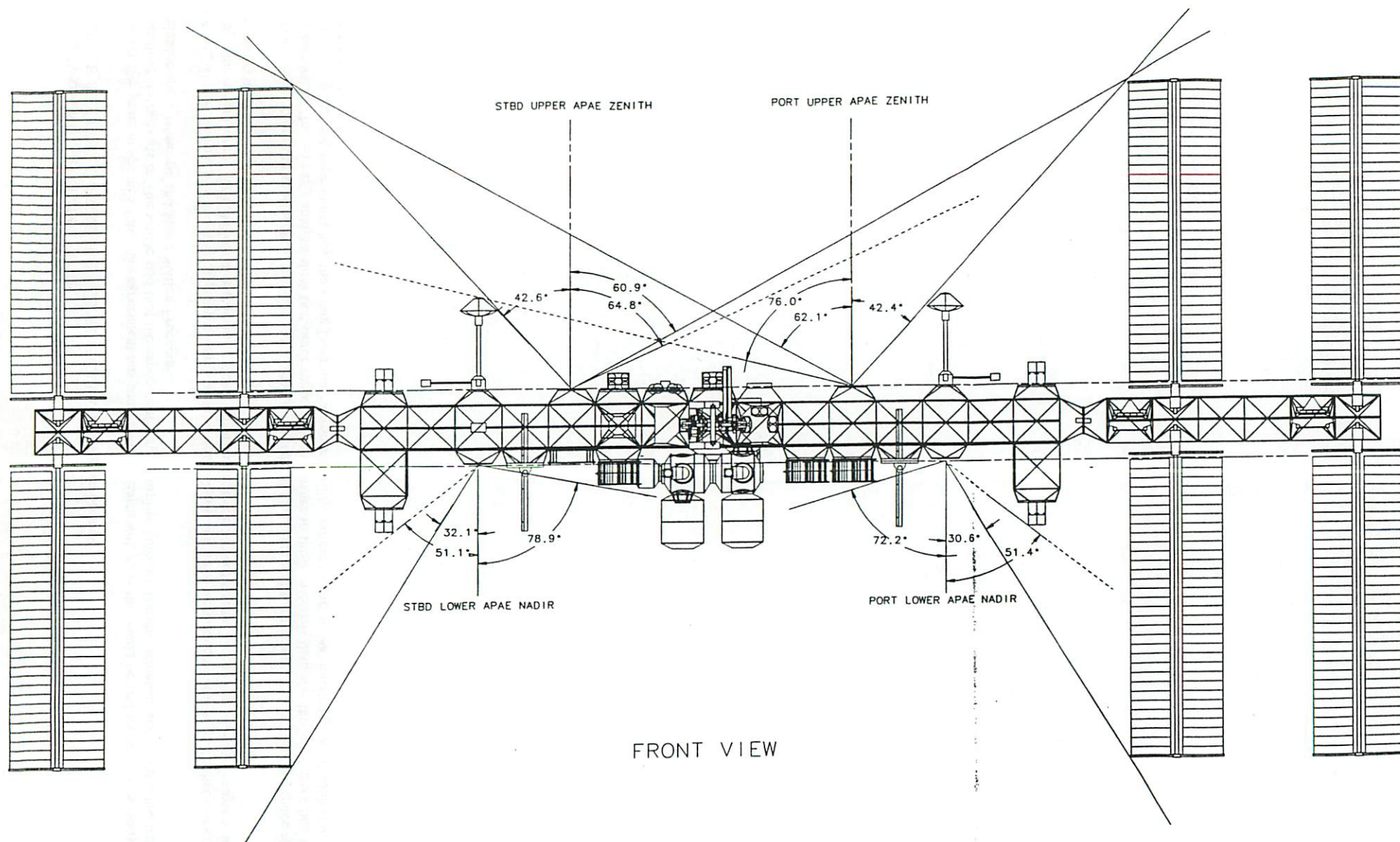
THE WASHINGTON TIMES -- APRIL 6

"SPACE BITS COULD HURT HUBBLE TELESCOPE" By Stephen Strauss

"After five years in space, a Canadian experiment has come down to Earth with news that could be bad for long-term plans to park sensitive instruments in The article said that the experiment results surprise Univ. of Toronto scientists and could cause trouble for the Hubble space telescope and Space Station Freedom".

Along with meteoroid pits and free oxygen corrosion, about a dozen 1-1/4 inch holes were found in the satellite that carried the experiment that would have "killed an astronaut or done real damage inside a space station," according to Rod Tennyson, head of the experiment.

The carbon-composite substances tested are about 1/6th the weight of aluminum and were expected to be ideal for space station construction, "but an early analysis show that outer space is much harsher to those materials than was thought," according to the article and that the experiment bus, the Long Duration Exposure Facility, suffered up to 10,000 micrometeoroid collisions.



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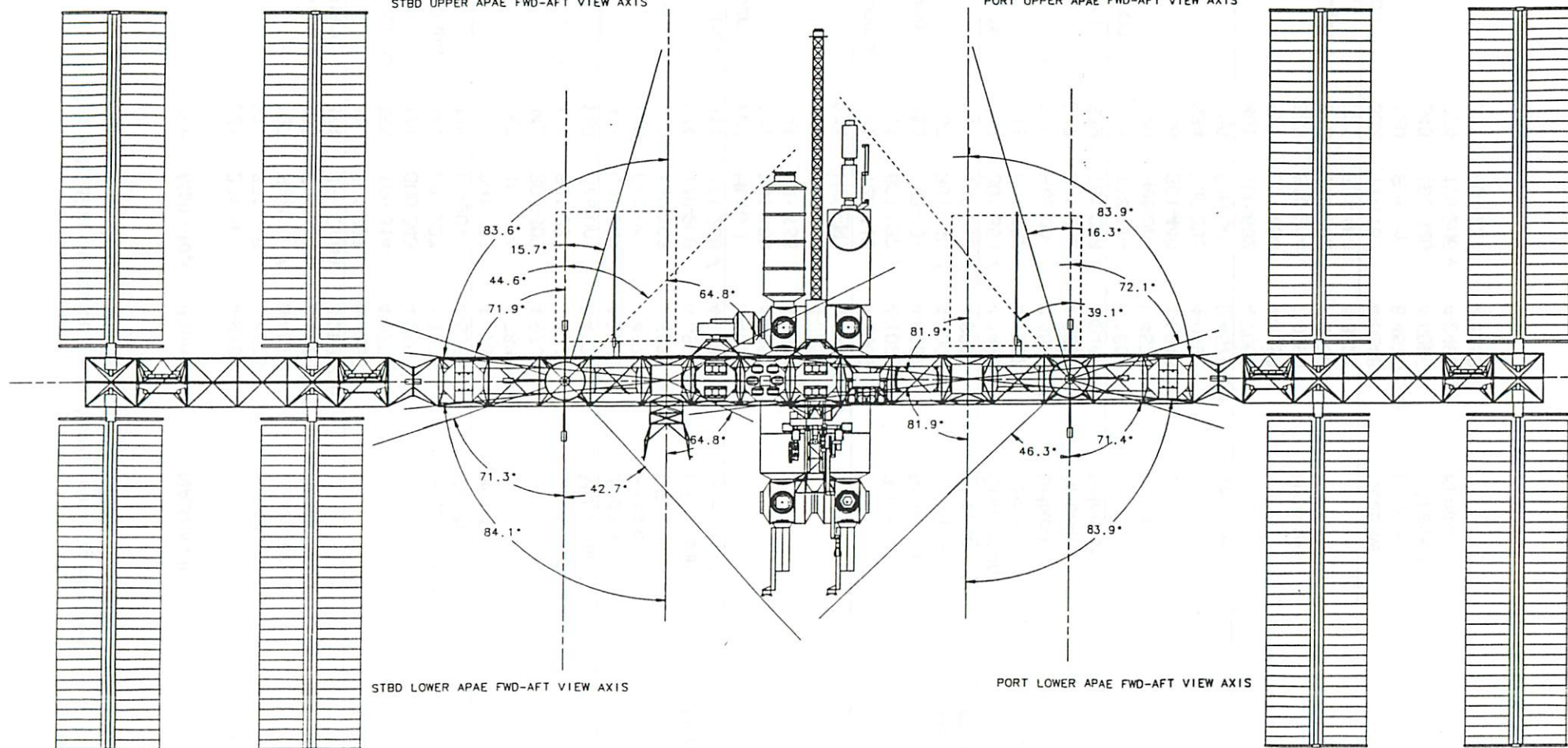
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Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

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Laskin, Bob	343	198-326	4-5086	RALaskin	
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Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
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Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
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Total: 101 (81 paper, 19 NASAmail) * Printed 4 April 1990

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-503

16 April 1990

TO: Distribution

FROM: Randy Cassingham *RC*

SUBJECT: SS Utilization Team Minutes for 16 April 1990

PRESENT: Rob Staehle, Randy Cassingham, Sima Lisman, Paul Henry

Next Meeting: 23 April 1990 at 10:30 in 301-271

Rob Staehle

Paul Henry will coordinate the "Station-literate volunteers" who will work two weekends (Fri-Sun May 4-6 and Sat-Sun May 12-13) at the Air-Space America show in San Diego. The volunteers will answer questions at a Space Station module walk-through mockup.

Boeing just issued a "Fault Management Scenario for OMA" scenario to describe software operations to show examples of specific functional requirements for OMA interfaces to System and Element Manager application software. Rob passed on copies to Paul Henry, Hershal Fitzhugh and Chuck Ivie. Anyone else interested in getting a copy should contact Randy Cassingham.

Rob will be travelling to Ames Research Center on Tuesday (Manned Mars), Reston on Thursday, and HQ on Friday.

Paul Henry and Sima Lisman should send a memo to Rob, with a schedule and budget, by April 20 showing their plan to close out their JSO-funded tasks.

Sima Lisman

The outlook is positive for new funding on the Disturbance Simulation and Management Tool. Both Jack Sullivan and Steve Del Basso (both of SSEIC) have sent memos to their bosses (Dick Williams/MSU and Al Lindenmoyer/MSS, respectively) supporting continuance of the effort.

Paul Henry

Paul will be meeting with Mark Sistilli/EM to demonstrate the Stand-Alone Kit concept. He will have a "new, improved" model to replace the now-broken previous model, which was improperly de-integrated from an airliner earlier this month...

Code MT funding still has not arrived. Paul will see if Camille can track down what happened to the funds.

Upcoming Meetings

April 16-21: DMS Operations Management Applications PDR in Houston. Chuck Ivie to attend.
May 14-15: UDAWG meeting at MSFC. Paul Henry and Hershal Fitzhugh to attend.
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September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related Items from Code L's "Daily News in Brief" (Typos not corrected...)

THE WASHINGTON TIMES, APRIL 11
"NASA'S GREEN MONSTER" (Editorial)

"Folks in City Washington are planning a big project called Mission to Planet Earth. It may cost those of us who live in Country America more money than a whole flight wing of B-2 bombers, but the idea is a lot more mankind-friendly and could have positively cosmic implications."

"The very idea can make you feel like hugging Martin Sheen," opines the TIMES, saying that understanding how the Earth works is a good and prudent idea, but the editorial sees "something a little more insidious. The editorial says that an official NASA brochure promoting the project smells a little of One World politics and Earthy Mother technology. Quoting several brochure statements, the TIMES cites a back cover inscription: "This we know; the Earth does not belong to man, man belongs to the Earth," and says, "This saccharine and dubiously meaningful epiphany, which every religion that traces its roots to the book of Genesis would regard as untrue, is attributed to Chief Seattle, an otherwise unidentified 19th century wiseman."

"The editorial, noting inequitable benefits accruing to foreign partners and terming the project "a massive transfer of payment from U.S. workers to the so-called 'international scientific community,'" still supports the project if communist nations were excluded and the project were transferred to the Environmental Protection Agency instead of draining NASA's budget."

It concludes, "When the data come in, we can scrimmage with the greens on the hard fields of true science and see who comes up black and blue."

* * * * *

SPACE NEWS -- APRIL 9-15

"ENGINEERS PREDICT STATION ROBOTICS WOES WILL GROW" By Douglas Isbell

"U.S. planning for automation and robotics on the international space station as of July 1989 was poor and likely to pose more problems as the facility grows, according to a report by a committee of NASA engineers dated March 1990."

The SPACE NEWS story says a draft of a subsequent report is "more favorable", but, according to space station program director Robert Moorehead, the plan remains in draft form and has not yet been adopted as a guide.

The publication reports the comprehensive plan is eight months overdue to the Advanced Technology Advisory Committee. The group is made up of 18 NASA engineers and two non-agency academic members. The final version of the advisory committee's next report is to be submitted to Senator Albert Gore (Tenn.), chairman of a Senate Oversight Committee.

AEROSPACE DAILY, APRIL 16

"ASAP CALLS SINGLE SPACE STATION AIRLOCK AN 'UNACCEPTABLE RISK'"

"NASA'S cost-cutting decision to eliminate one of two airlocks on the Space Station poses an 'unacceptable risk' to the crew and the second airlock should be restored to the baseline configuration, the Aerospace Safety Advisory Panel (ASAP) said Friday."

The DAILY reports the panel said testing automation and robotics technology together could extend the state-of-the-art, however it should be monitored. And, recommended that NASA develop a structural overhaul plan for the orbiter fleet, keeping it flying for another 20 years. The plan would be based on one developed by the Air Transport Association for the U.S. airline industry.

R. Cassingham

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-509

23 April 1990

TO: Distribution

FROM: Lori Paul *RC for LP*

SUBJECT: SS Utilization Team Minutes for 23 April 1990

PRESENT: Rob Staehle, Hershail Fitzhugh, Paul Henry, Kristan Lattu, Sima Lisman, Lori L. Paul, Jeff L. Smith

Next Meeting: 30 April 1990 at 10:30 in 301-271

Rob Staehle

The Air/Space America show, which was scheduled to start on May 4 in San Diego, has been canceled due to lack of funding and exhibitors. Four JPLers were slated to help out with NASA HQ's Space Station exhibit.

The Fifth Conference on Artificial Intelligence for Space Applications will take place on 22-23 May 1990 in Huntsville. Rob Staehle has a flyer.

Lori Paul will continue to encourage TMIS connectivity for JPL/Pasadena, including full access to the ARMS (Automated Requirements Management System) database resident in TMIS. Lori Will work with Jim Jacobson/372 to accomplish this.

Ray Starsman

Ray Starsman, Acting Director of the JSO Program Evaluation Division (PED), attended the meeting and presented an overview of Requirements Management for the Space Station Program. (Selected viewgraphs are attached.) Pasadena support in different disciplines may be requested from time to time on a short-term basis for help in evaluating the impact of change requests proposed for Space Station Control Board action. Rob will coordinate these support requests.

During the discussion, Jeff L. Smith expressed concern regarding the lack of access to final Space Station contracts. SDTM and FROST may require some data available only through contractors. Rob Staehle and Ray Starsman asserted that contracts should be "public domain," and encouraged further effort to obtain them if needed.

Jeff also noted the inconsistencies between requirements in the PRD and PDRD. Ray acknowledged that ARMS has not yet resolved some of the differences.

Ray announced that Bob Gass, an ARINC contractor on staff at JSO, has written a redundancy management document which addresses the need for redundancy in critical Space Station systems (those systems which would cause death or destruction of the Station if they failed).

Kristan Lattu expressed concern that PDR reviews have been scheduled so close together. She feels the overlapping schedules will severely limit the attendance of JPL technical staff, or anyone else wishing to participate in several reviews.

Rob expressed additional concern that, according to a report at the last OSSA Space Station Utilization Program Review, many PDR decisions are, in actuality, made at the contractor level and inflexibly is established by the time NASA conducts the regular reviews. Ray did not agree that this is so.

Ray requested clarification of JPL's role in the PDR reviews. Rob responded that JPL has no formal role in the reviews. However, JPL has provided technical experts at the request of others.

Sima Lisman

Discussions are continuing with possible Level II sponsors of the Disturbance Simulation and Management Tool. Sima and Bob Laskin plan a trip to MSU/Reston in the next few weeks to discuss their needs for continued development. Rob encouraged Sima to have a written, tentatively JPL-approved plan with them at that time, rather than waiting until after their meeting to create the plan.

Paul Henry

Paul and Rob made a Stand-Alone Kit presentation to Mark Sistilli/EM, who was impressed and enthusiastic about the concept. In fact, Mark suggested the kit be bigger and offer more power than is currently planned. Sistilli will carry an informal proposal to Bob Rhome/E in an effort to obtain funding for the Kit. Mike Devirian suggested that the Europeans might be interested in the Kit.

Paul will provide Rob with his Accommodations Strategies task closeout plan on Tuesday.

Jeff L. Smith

At the request of the Europeans, the FROST (Freedom Operations Simulation Testbed) "Spring Fling" has been officially postponed until late Summer or Fall of 1990. The Europeans remain very interested in FROST, but they wish to supply FROST with their own data before a formal meeting takes place at JPL.

The current stance on space-to-ground communications is to not provide any virtual channelling capability, but rather sort out packets on the ground. Jeff thinks this would result in quite expensive packet sorting systems at the Data Interchange Facility.

Hershal Fitzhugh

Fitz has three documents available:

1. "Thermal Control Systems (TCS) Orientation Handbook"
2. "Operations Management System (OMS) Hardware Orientation Handbook"
3. "MSAMS (Microgravity Science Applications Management System) On-Line User's Guide"

Miscellaneous information from the Small Attached Payload/Code EM Alternate Assembly Sequence Proposals, presented by Mark Sistilli to Kohrs:

- IBM and Honeywell are expected to be the contractors for the data interface boards between the Station and payloads. They may be proprietary. Some advocate an open architecture, which could be effectively limited if the boards contain proprietary equipment.
- No real high rate data input for the multiplexer-demultiplexer interface exists. The present system requires a port with an optical cable. Code E users are asking that an electronic interface board be provided so that difficult optical matching won't have to be done by the users.
- A manual "patch panel" (similar in concept to what old style phone operators used to manually "patch" telephone calls through) is currently planned. No automated system is planned, even though one apparently is or was required by the PRD. Concerns were expressed over a reported lifetime limit, and crew time required to reconfigure the patch panel (an automated panel would be configurable from the ground). Further, the patch panel allows only 100 port inputs, though a minimum of 108 ports will probably be required.

- When the DMS people gathered requirements, they considered "users" to be anyone who used the DMS. Payload users are not considered as users under this definition. Therefore, the DMS people may not have an accurate idea as to what *payload* users want from the DMS.
- OSSA requested WP-02 provide a schedule that addressed interface card builds, simulators, integration, and training kits.

Kristan Lattu

The first round of laboratory support equipment telecons are almost complete. A second round will collate engineering change requests and conclude with a closeout meeting in July. The closeout meeting will be transmitted by Science Utilization Management Team staff, published, and sent to Bill Lenoir/M.

Lori Paul

Randy Cassingham will be missing several meetings, taking the time to catch up to a short Code MSU deadline for the next draft of the recently resurrected *Introduction to Utilizing Space Station Freedom* document task. A copy will be sent to Ray Starsman per Tom Kehoe's request when the draft is available; perhaps as soon as two-to-three weeks from today. Lori Paul will be taking notes for the minutes.

Upcoming Meetings

May 14-15: UDAWG meeting at MSFC. Paul Henry and Hershal Fitzhugh to attend.

May 22-23: Fifth Conference on Artificial Intelligence for Space Applications in Huntsville. No one yet slated to attend.

May TBD: User Integration Panel meeting at MSFC. Rob Staehle to attend.

June 3-6: Case For Mars symposium in Boulder. Rob Staehle to attend.

June 20-22: First International Symposium on Measurement and Control in Robotics at JSC. No one yet slated to attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

NEW YORK TIMES -- APRIL 17

"JOINT MISSIONS TO MARS REJECTED BY U.S. PANEL"

"Joint missions to Mars by the United States and the Soviet Union are too risky now, a panel of experts convened by the National Academy of Sciences said today (April 16). It recommended instead that the two nations follow "a gentle path" of coordinated but independent explorations."

The reason given by the panel of experts, according to the AP story, is that "The United States and the U.S.S.R. have no prior experience with the degree of cooperation necessary to carry out a technical project of this complexity or magnitude".

AP says the report "appeared to chill the idea frequently expressed by many experts that Mars could be explored jointly, allowing the United States and the Soviet Union to do together what would be too expensive for either to do alone".

The panel recommended that a cooperative effort on exploration would be much more beneficial than an independent approach or a highly coordinated program.

The story says many proposals have been made to initially conduct an unmanned Mars mission by having one nation build a Mars lander to obtain samples, while the other build the necessary experiments for obtaining and analyzing samples.

The panel felt a cautious approach "would allow a graceful path to increasingly close levels of cooperation".

SPACE NEWS -- APRIL 16-22

"ARIANNE ACCIDENT CAUSE FOUND" By Peter de Selding

"PARIS -- A piece of cloth mistakenly left inside a water pipe feeding a first-stage engine caused the February 22 explosion of an Ariane rocket carrying two Japanese communications satellites, investigators announced last week."

The cloth was found, SPACE NEWS said, trapped against a water valve in the engine that was recovered from the ocean off the French Guiana coast. An investigation board said neither the design nor launch procedures were at fault; simply that the loss of the rocket and its two satellites was the result of human error.

The total loss (booster and satellites) was estimated at about \$250 million.

Arianespace says it hopes to make up for the delay by accelerating the launch schedule this year and next. By 1992 there should be no delays in the present manifest.

UNITED PRESS INTERNATIONAL -- APRIL 13

"(MOSCOW -- The Soviet Union has not sent women into space since 1984 because of the demanding nature of work as a cosmonaut and the potential for "moral and ethical" problems, an official said Friday."

According to UPI, the head of the Soviet civil cosmonaut's training program, Alexander Alexandrov, told Tass News Agency that although the Soviet Union was the first nation to send women into space "more recent developments, such as space walks, make the work of a cosmonaut more difficult".

The story noted that on the next NASA space shuttle flight Kathryn Sullivan will take a space walk if it is found necessary to clear up any problems with the Hubble Space Telescope after it has been deployed from the Discovery's payload bay. Jeff Carr, of the NASA Johnson Space Center, told UPI, "There is absolutely no reason, medical or otherwise, not to consider women for tasks we consider for men to conduct".

SPACE FAX DAILY, APRIL 19

"WEST GERMANY SIGNS \$9 MILLION AGREEMENT WITH SOVIETS TO SEND GERMAN ASTRONAUT TO MIR"

"Now the West Germans have signed on with the Soviet Glavkosmos space agency's 'pay as you go policy' to get a West German to the Mir space station, but they'll have to wait in line until 1992 to do it."

SPACE FAX reports a Japanese astronaut will go to the station on December 2nd followed by an English astronaut next year. A French and an Austrian astronaut are also included on the list.

AEROSPACE DAILY, APRIL 19

"ROCKWELL AWARDS BENDIX SPACE STATION, SHUTTLE SUPPORT CONTRACTS"

"Allied-Signal Aerospace Co.'s Bendix Field Engineering Division will manage the Space Station training facility and control center at Johnson Space Center under an eight year, \$99 million contract awarded by Rockwell International Corporation."

The story says the Bendix Field Engineering contract includes a two year option valued at \$41 million to provide overall management for the Space Station training facility and to operate and maintain the ground communications, computer and display systems.

AEROSPACE DAILY says this is in addition to the Shuttle program ground systems support the unit has been providing since 1986.

THE NEW YORK TIMES, APRIL 23

"NO 'HORRIBLE DESIGN FLAW' IN THE SPACE STATION" by NASA Administrator Richard H. Truly (Letter To The Editor)

"To the Editor:

The future of this country's space station, and indeed the future of the civil space program, is too important a part of our nation's well-being to permit me to ignore 'NASA's Black Hole in Space' (editorial, March 29), which escalates the discussion of a technical issue into another attack on human space flight."

The letter said, "There is no 'horrible design flaw' in the space station. The space station has a multitude of purposes for which it is not only ideally suited but uniquely capable."

The station is described as a lab for manifold opportunities and as a foundation for solar system exploration. And, the letter cites possible new discoveries as well as past accomplishments of space exploration.

The Space Station team is working toward its preliminary design review, testing "practicality and engineering possibility," making corrections and moving forward in an orderly and unsurprising fashion.

The NASA administrator said, "What is surprising and disturbing is that you should fail to understand this process to such a degree that you regularly play the sky is falling down in your commentary and ask what national purpose is served by putting humans in space. How would Columbus or Magellan or Sir Francis Drake have answered a similar question before their journeys?"

AEROSPACE DAILY, APRIL 23

"TDRS 1 REACTIVATED AS FILL-IN FOR FAILED TDRS WEST EQUIPMENT"

"NASA is reactivating its first tracking and data relay satellite (TDRS), launched seven years ago, to supplement K-Band communications equipment on the TDRS West satellite that has been partially inoperative since it malfunctioned Jan. 16, Eugene Ferrick, director of NASA's Space Network Division in the Office of Space Operations, reported."

The DAILY said loss of K-band capability caused competition for time and Eosat operators of Landsat 4 and 5 (of lower priority) are concerned about critical upcoming "growing season requirements" considered their "bread and butter."

The story reports NASA's TDRS boss Eugene Ferrick said the agency started moving TDRS 1 to support TDRS 3 March 29 and that it should be in place by May 1. According to the DAILY, expected additional requirements of next month's Astro-1 and November's Gamma Ray Observatory missions predicated the move.

AEROSPACE DAILY cites NASA's concern of TDRS 1 effectiveness until TDRS 5 is launched in May 1991, recounting its age with difficult operating life and questionable fuel level.

SPACE STATION FREEDOM

ESA

ELEMENTS:

- PRESSURIZED LABORATORY MODULE
- POLAR PLATFORM
- MANNED-TENDED FREE FLYER (MTFF)

JAPAN

ELEMENTS:

- PRESSURIZED LABORATORY MODULE & EXPOSED FACILITY
- EXPERIMENT LOGISTICS MODULE

NASA/GODDARD (Maryland)

ELEMENTS:

- POLAR PLATFORM-
- ATTACHED PAYLOAD ACCOM. (2)
- TELEROBOTIC SERVICER

NASA/MARSHALL (Alabama)

ELEMENTS:

- PRESSURE SHELLS FOR NODES
- LABORATORY MODULE
- HABITATION MODULE (OUTFITTING TD BY JSC)
- LOGISTICS MODULE (PRESS & UNPRESS)

SYSTEMS:

- ECLSS
- INTERNAL THERMAL CONTROL
- INTERNAL AUDIO & VIDEO

NASA/JOHNSON (Texas)

ELEMENTS:

- TRUSS
- MOBILE TRANSPORTER (PHASE I)
- AIRLOCKS
- NODES (PRESSURE SHELL - MSFC)

SYSTEMS:

- EXTERNAL THERMAL CONTROL
- EVA
- DATA MANAGEMENT
- COMMUNICATIONS & TRACKING
- GUIDANCE, NAVIGATION & CONTROL
- PROPULSION (THRUSTER TD BY MSFC)
- NSTS/SS ATTACHMENT SYSTEMS

CANADA

- MOBILE SERVICING CENTER
- SPECIAL PURPOSE DEXTEROUS MANIPULATOR
- MSC MAINTENANCE DEPOT

NASA/LEWIS (Ohio)

ELEMENTS:

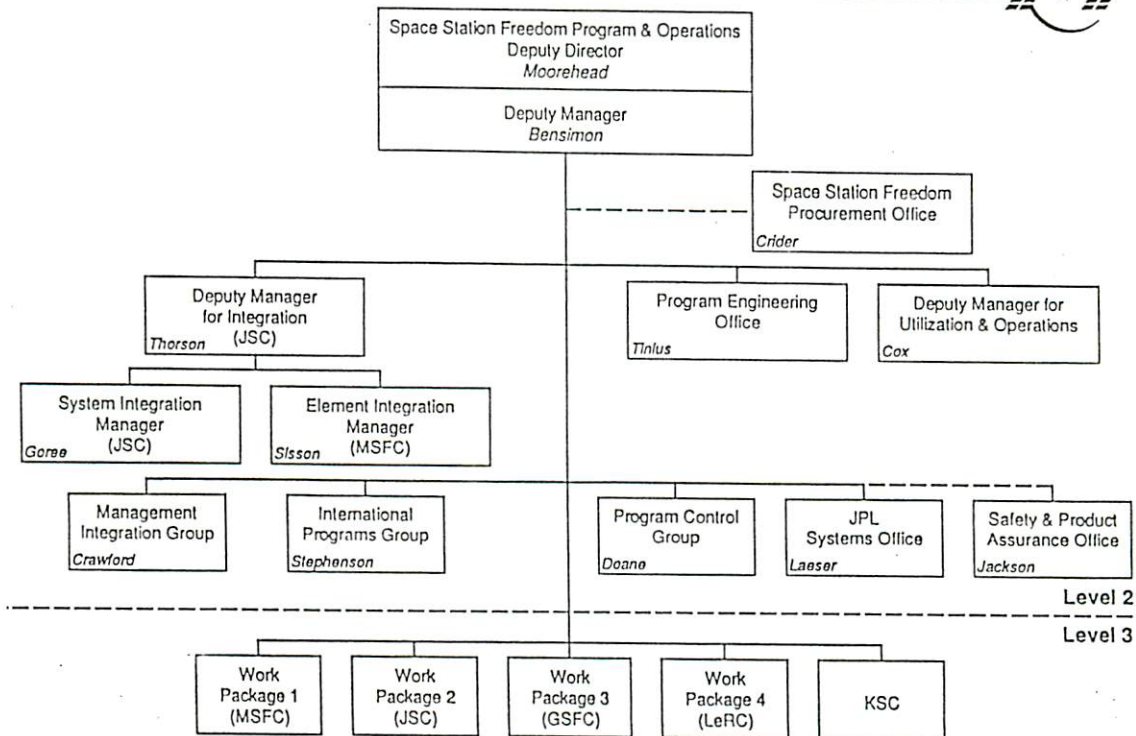
- POWER MODULES - PV

SYSTEM:

- ELECTRICAL POWER DISTRIBUTION

OSSTT 88E

Space Station Freedom Program Office



1-2

Proposed

03/02/90 W/F 550-0000162-01

Program PDR Schedule

		1989		1990												1991	
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb
Program PDR Board									△	△	△	△	△	△			
Incremental PDR's																	
MSFC	ECLSS/TCS/IAV/STRUC/SW																
	LAB/EPS/DMS/FMS/MS																
	HAB																03/31/92
	PLCAULC																07/31/92
JSC	DMS/OMA																
	TCS																
	GN&C																
	EVA																
	C&T																
	Nodes/ALU/ITA/MT/MS Integrated Project																
GSFC	FTS																06/30/91
	APAE																
LeRC	SW/PMAD/PV/EPS Integrated Project																
Integrated System PDR																	
Ground System PDR																	1/91-2/91
International																	
ESA CSA	MSCMT																10/31/92
	MMMD/SPDM																03/31/92
	APM																11/30/91
	MTFF																03/31/92
	JEM/JELM																11/30/91
NASDA																	

R. Cassingham


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-517

30 April 1990

TO: Distribution

FROM: Lori Paul 

SUBJECT: SS Utilization Team Minutes for 30 April 1990

PRESENT: Rob Staehle, Bing Chen, Hershal Fitzhugh, Paul Henry, Sima Lisman, Gerry Murphy, Lori L. Paul, Jeff L. Smith

Next Meeting: 7 May 1990 at 10:30 in 301-271

Rob Staehle

The Space Summit – An International Conference on Manned Space Exploration – will take place 3-6 June 1990 at the Von Braun Civic Center in Huntsville, Alabama. Rob Staehle has a flyer. (Note: The Space Summit conflicts with the Case for Mars conference scheduled for the same time in Boulder, Colorado.)

On 19 April 1990 Robert Moorehead released the Space Station *Freedom* Program Master Schedule. Hank Beck forwarded a copy to JPL/Pasadena. See the flight element schedules attached.

Paul Henry and Sima Lisman wrote closeout plans for their tasks which were sent to Bob Easter for approval. Both the Relocatable Utility and Communications Stand-Alone Kit (RUCSAK) and Disturbance Simulation and Management Tool tasks will formally end on 1 June 1990.

In response to a request from the LaRC/Evolution Working Group, Paul Henry and Jeff H. Smith will be sending a brief synopsis of operations conflicts and issues involving Station evolution to George Gano. Langley will then review and prioritize the information in preparation for their participation in the PDR. Paul will cite the problem of Station orbital alignment adversely affecting the optimum launch trajectories for planetary missions (including the effects on propellant needs and mass to orbit capabilities).

MSFC is hosting a Space Station Freedom Mission Planning Workshop at the Huntsville Marriott Hotel (located near the Alabama Space and Rocket Center) in Huntsville, Alabama from 21 to 25 May 1990. Hershal Fitzhugh will be attending.

Also in Huntsville, the User Operations Working Group will meet on 15 and 16 May 1990. Rob suggests that Chuck Ivie and/or Kristan Lattu consider attending this meeting.

Bob Glass in Reston has requested comments on three change requests to the PDRD concerning:

1. Electrical Power Specifications and Standards
2. On-Orbit Factors of Safety
3. Baseline NIST X (Software) Window Standards

JSO can recommend approval of the CRs "as is" without comment, recommend approval of them with changes, recommend disapproval of them with comment, or remain silent regarding any recommendations. JSO is one of several Space Station organizations asked to comment on various CRs.

Gerry Murphy will call Bob Glass regarding the Electrical Power Specifications and Standards CR; should the EMC Group comment on the CR?

ARC is staffing several positions which will work on technology development for closed loop life support systems. If interested, contact William Berry at Ames (FTS 464-4930).

Phil Cressy/EM has a new FAX machine: FTS or (202) 472-5572.

JSO is conducting a study of the Closed Life Support System design. Jim Hyde/JSO is leading the study, which was "chartered to conduct a fact-finding review and analysis of the requirements and design implementations of all the hardware and software associated with life support."

Paul Henry

The Mars Trajectory Video adventure continues. 20 copies of the video were received and immediate distribution was planned. Upon review, however, Paul discovered that the sound track dubbing was very poor and the color quality of the copies was also unsatisfactory. Audio-Visual at JPL is redoing the copies. Distribution will take place as soon as possible.

A new technology disclosure is being put together for the RUCSAK concept as part of Paul's closeout activities. Paul is rewriting the disclosure to make it broader.

The long-promised EWG funding is now available. At Camille Hayes' request, Paul will submit an SRM for the full amount requested, though only one-half has been transmitted, with a promise for the rest.

A new task to write a five year structure and internal operations plan for Level I Utilization may be performed for Remer Prince/MU. Rob asked Paul to discuss aspects of the task with Bob Rhome/E. Also, Rob and Paul will contact Remer Prince to obtain more information and suggest a JPL approach and budget estimate.

Sima Lisman

Gerry Murphy and Bob Laskin will be visiting Reston to discuss Sima's Disturbance Simulation and Management Tool (DSMT) in connection with their other recommendations for modelling tools they feel should be used for Station design. There is loose cooperation between NASA Centers in the development of software modelling tools. Moorehead wants to see a more organized and well coordinated plan for software development among the Centers so that redundancy of effort is reduced and progress expedited. In connection with 521's work for Al Holt/MSU and Dick Williams/MSU, Gerry is responding to this request with a plan involving a set of "environmental" tools, including DSMT, VAPEPS, some thermal modelling and plasma and neutrals contamination models. Dana Brewer/MSE will also be involved with the plan, which is intended for John Cox's/MSU review before being presented to Moorehead/MS. Other Centers are also involved in the plan.

Sima is concerned about the poor prospects for immediate (post June) FY90 funding. She is seeking support for her tasks.

Jeff L. Smith

FROST 1.0 will be delivered at the end of June. The software is working well and there has been good progress. The day after formal release there will be an all day FROST demonstration in Reston.

SDTM 1.3 will be released by the end of May. Design changes have been necessary since the re-phase of the Station. Also, difficulties developed because of incompatibilities between the 4 equipment databases which provided basic equipment data for SDTM. SDTM used the Weight

database exclusively to circumvent this problem. SDTM 2.0 will be released in August and complete the main development of SDTM.

SDTM and MESSOC completed a successful three day training course two weeks ago at Caltech. A total of 17 persons attended, primarily contractors. Comments about the course were very favorable. All work package centers were represented.

Bing Chen

Bing continues to support Dick Grumm MCPF science scenario definition.

Hershal Fitzhugh

Kristan is continuing the series of the Lab Support Equipment telecons.

Fitz is working on improving the Spacelab Mission Requirements on Facilities/Instruments/Experiments (MROFIE) and will be meeting soon with Space Lab Principal Investigators and Harry Kraft at Marshall. The MROFIE will serve as a basis for Space Station documentation levying requirements on users.

Lori Paul

Lori is in the process of compiling JPL's inputs to the revision of the Space Station Freedom Media Handbook. The revised text will be sent to Hank Beck/JSO for incorporation in the new version of the handbook. Wayne Schober will supply text covering JPL's A&R work. Rob has asked Lori, Paul Henry, Hershal Fitzhugh, Randy Cassingham, Dick Grumm, Peter Tsou, Gerry Murphy, Frank Wright and Jeff L. Smith for input.

TMIS connectivity is still pending. A progress report from Jim Jacobson (JPL) is expected soon.

"Committees are, by nature, timid. They are based on the premise of safety in numbers; content to survive inconspicuously, rather than take risks and move independently ahead. Without independence; without the freedom for new ideas to be tried, to fail, and to ultimately succeed; the world will not move ahead, but live in fear of its own potential."

—Prof. Ing. h.c. F. Porsche

Upcoming Meetings

May 14-15: UDAWG meeting at MSFC. Paul Henry and Hershal Fitzhugh to attend.

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Recent Space Station-related items from Code L's "Daily News In Brief" (Typos not corrected...)

SPACE NEWS -- APRIL 30-MAY 6

NASA SEARCH FOR MOON AND MARS EXPLORATION IDEAS PLACED ON HOLD" By Andrew Lawler

"Congress has placed on hold a NASA program to solicit alternative approaches for a lunar base and Mars expedition because of resistance on the part of some members to allow NASA to start spending on the exploration proposal."

SPACE NEWS reports that private industry and national laboratory officials "have been waiting since last fall for NASA to begin a formal effort" to formally request innovative ideas for space exploration.

The program, endorsed by the National Space Council, would request universities, private industry and other federal agencies to "brainstorm" ways to settle the Moon and Mars.

The publication says Congressional committees want the agency to "formally request permission from Congress" to reprogram money for the effort from other offices in the aeronautics, exploration and space technology office. The story then says, "NASA officials said they do not believe a formal letter requesting reprogramming from Congress is necessary, since the money would be used by the same office".

A NASA "official" was quoted as saying, 'We are not going to proceed against the wishes of our appropriations committees'.

AEROSPACE DAILY -- MAY 1

"NASA UNDERESTIMATING SPACE DEBRIS THREAT"

"NASA is designing the Space Station using data on space debris that 'significantly underestimates' the potential for collisions during its 30 year lifetime, the General Accounting Office reported".

According to the DAILY, the report was prepared for the House Science, Space and Technology Committee which, a staffer says, will hold hearings on the report at an undetermined future date.

The DAILY says NASA has been studying the space debris situation at the Station's planned 300 mile altitude but that NASA discounted a preliminary study showing a sharp increase in expected debris at that altitude because of the large error margin in the study.

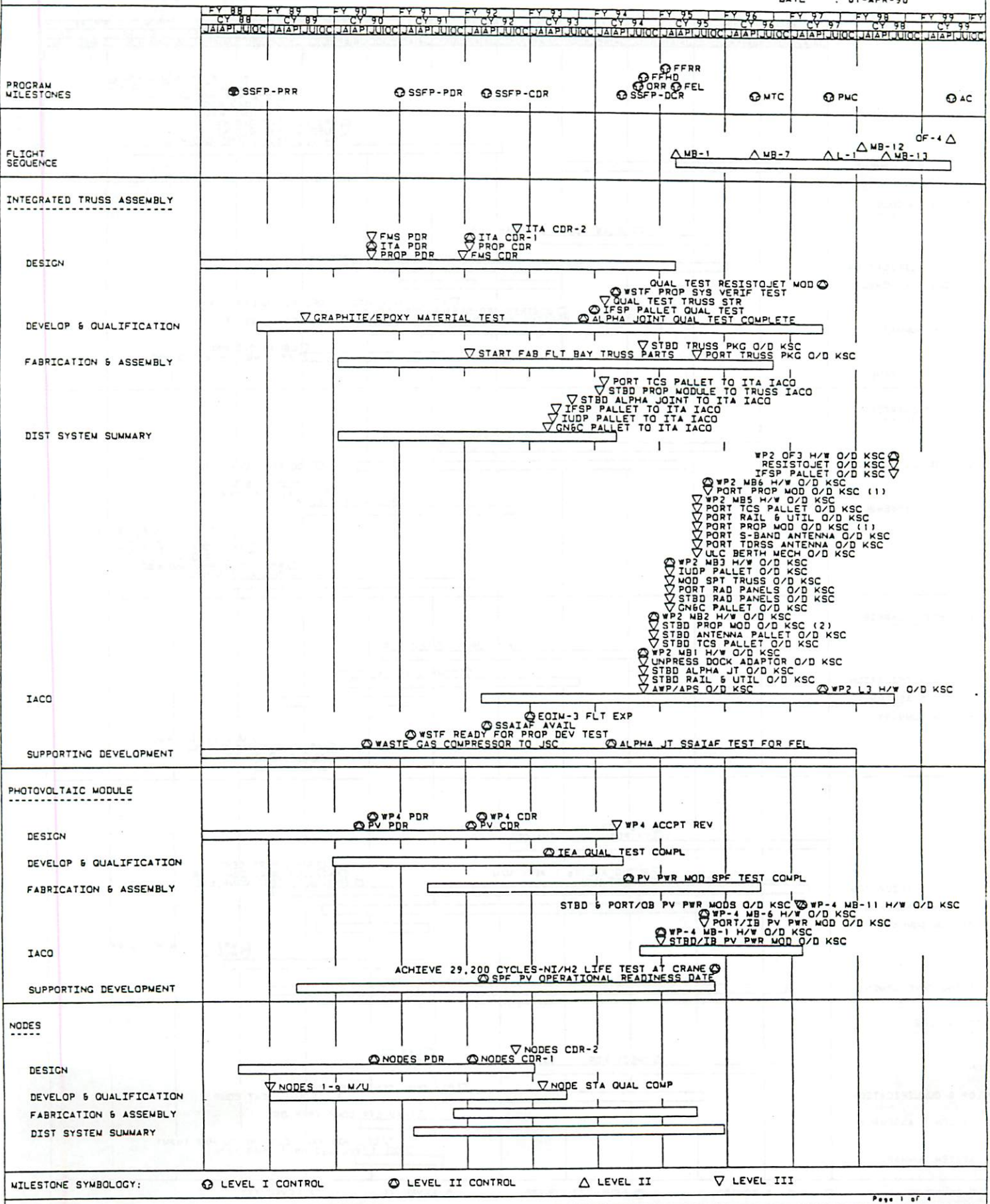
AEROSPACE DAILY quotes from the GAO report, stating there are an estimated 24,500 pieces of rocket debris, exploded satellites, paint chips and other debris of at least one centimeter diameter which pose the greatest threat to the Station and Shuttle missions. The DAILY continues quoting from the GAO report, which states the kinetic energy of a one centimeter particle travelling at orbital velocities is equivalent to a 400 pound object travelling at 60 miles per hour.

The story cites work which NASA is conducting with the Air Force to track and characterize the debris field at orbital altitudes and says the GAO report gives NASA high marks for the continuing studies. The publication quotes NASA Assistant Deputy Administrator John O'Brien as saying the current work will be updated when new debris estimates have been further refined but that uncertainties of debris estimates now vary by factors of from two to five.

The DAILY further quotes O'Brien as saying that data from the recently retrieved Long Duration Exposure Facility will be incorporated in the studies as soon as they are available.

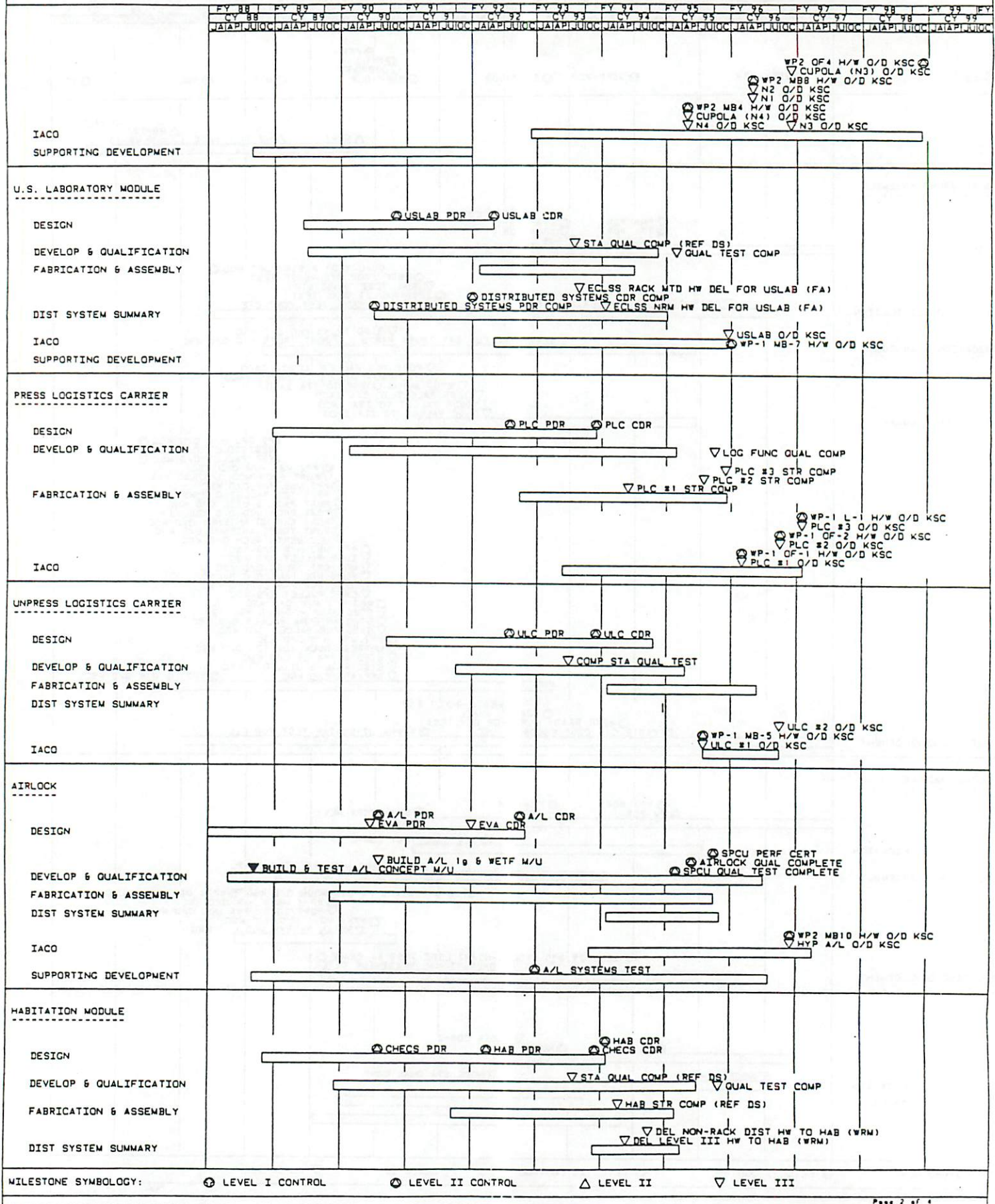
SPACE STATION FREEDOM PROGRAM MASTER PROGRAM SCHEDULE FLIGHT ELEMENTS

CONTROL#: SSFP0003.0
BASIS : CR#BB000605A
DATE : 01-APR-90



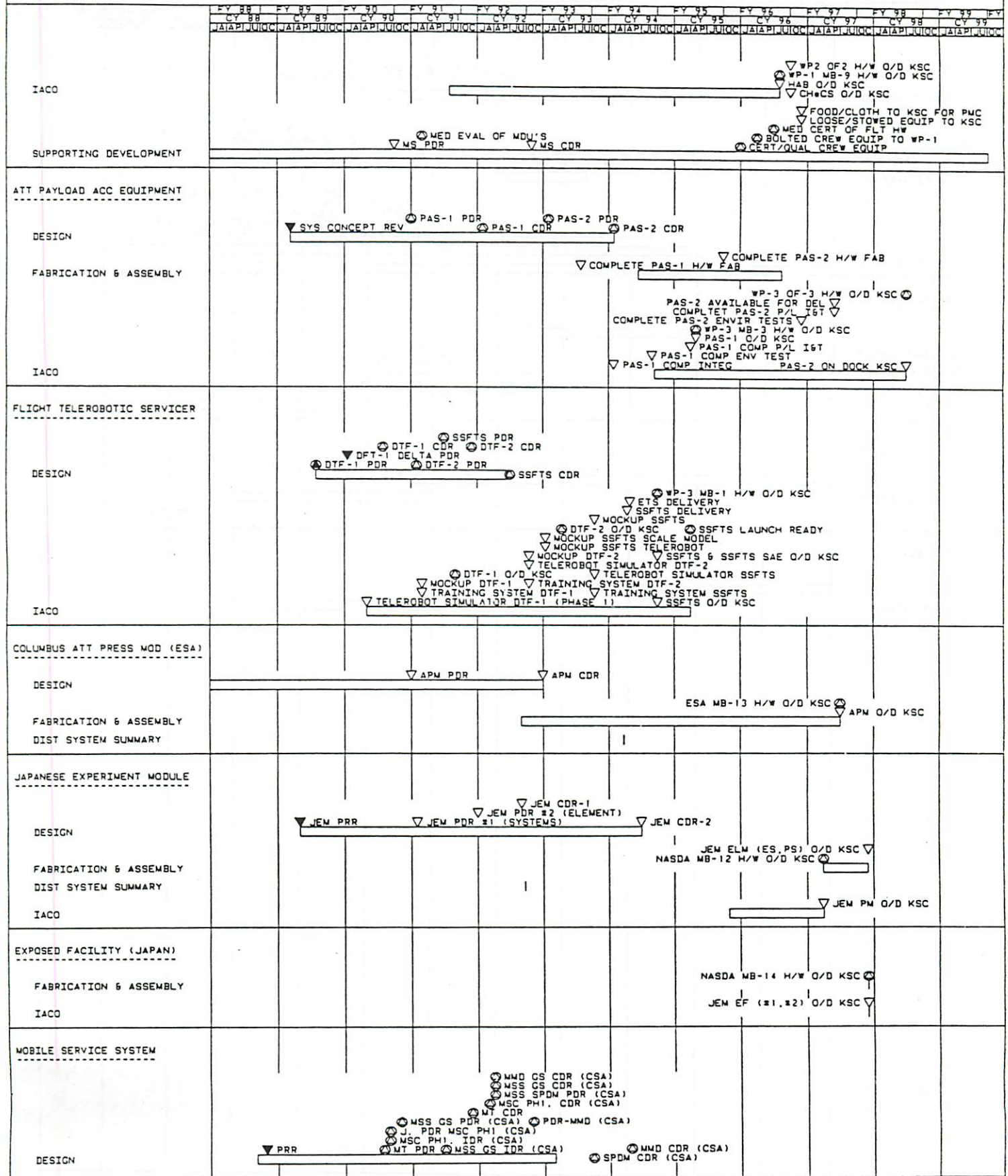
SPACE STATION FREEDOM PROGRAM MASTER PROGRAM SCHEDULE FLIGHT ELEMENTS

CONTROL#: SSFP0003.0
BASIS : CR#BB000605A
DATE : 01-APR-90



SPACE STATION FREEDOM PROGRAM
MASTER PROGRAM SCHEDULE
FLIGHT ELEMENTS

CONTROL#: SSFP0003.0
BASIS : CR#BB000605A
DATE : 01-APR-90



MILESTONE SYMBOLOLOGY:

● LEVEL I CONTROL

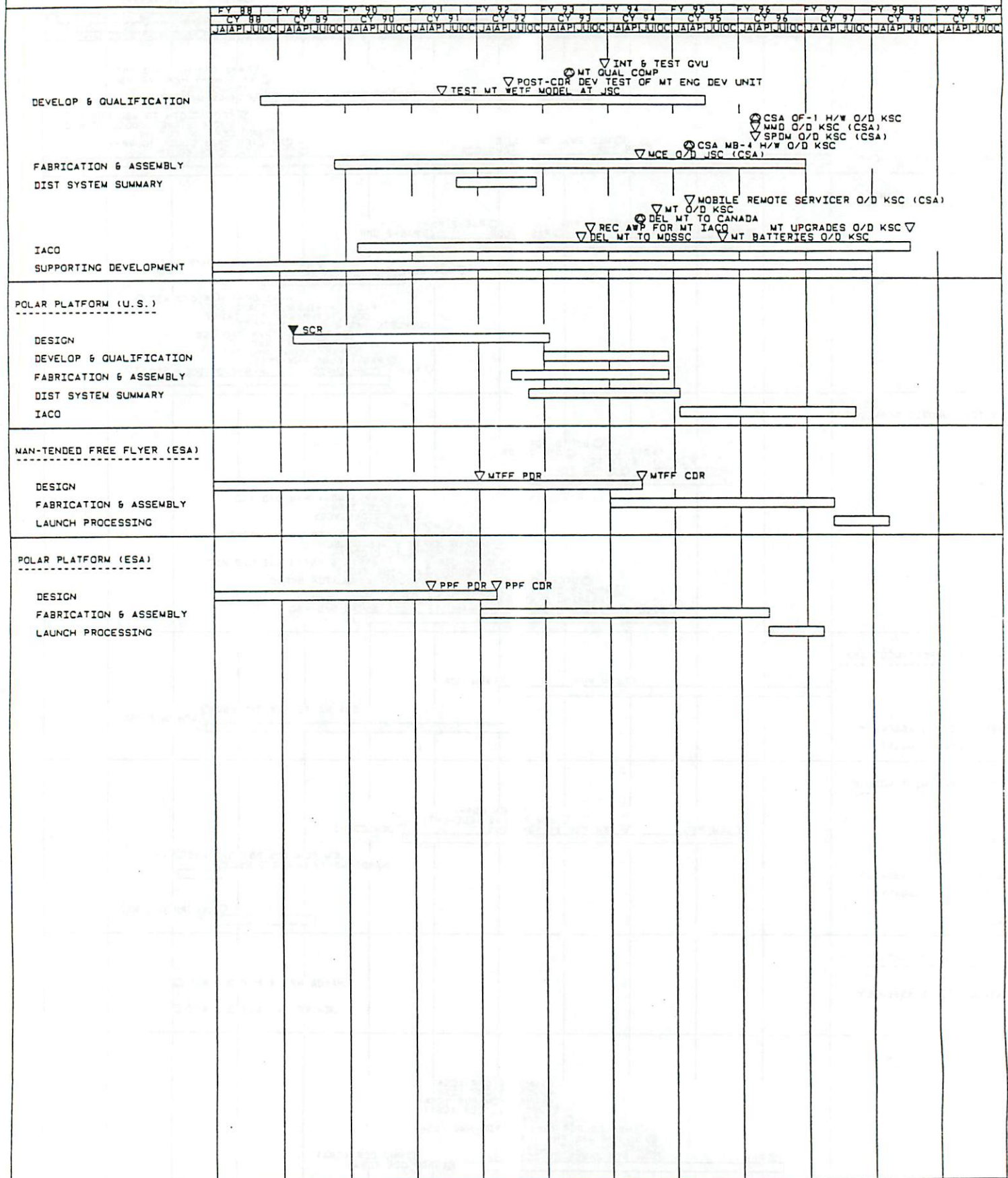
○ LEVEL II CONTROL

△ LEVEL II

▽ LEVEL III

SPACE STATION FREEDOM PROGRAM
MASTER PROGRAM SCHEDULE
FLIGHT ELEMENTS

CONTROL#: SSFP0003.0
BASIS : CR#BB000605A
DATE : 01-APR-90



MILESTONE SYMBOLOLOGY:

● LEVEL I CONTROL

⊗ LEVEL II CONTROL

△ LEVEL II

▽ LEVEL III

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Arnett, James	521	301-466	4-9282		JArnett
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brunstein, Sam	334	300-243	4-2561		
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	183-401	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	113-114	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	512-202	7-9130		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		

	Sec	Mail Stop	Phone	NASAmail	TELEmail
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
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Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
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Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	264-648	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

✓ = Sent via NASAmail. To switch to NASAmail delivery, please send message to RCassingham.

Total: 100 (80 paper, 19 NASAmail) * Printed 2 May 1990

R. Cassingham

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-523

7 May 1990

TO: Distribution

FROM: Lori Paul

SUBJECT: SS Utilization Team Minutes for 7 May 1990

PRESENT: Rob Staehle, Hershaf Fitzhugh, Paul Henry, Chuck Ivie, Sima Lisman, Lori L. Paul

Next Meeting: 14 May 1990 at 10:30 in 301-271

Correction to the 30 April 1990 minutes: In the discussion of task closeout plans it should have been noted that Bob Edelson/JSO has written closeout plans for the following tasks:

Software Availability (Michael Lyu)	Closeout on 6-30-90
Electrical Power System (Stan Krauthamer)	Closeout on 6-08-90
Pressurization Study (Frank Tillman)	Closeout on 5-11-90

Rob Staehle

In response to a request from the Evolution Working Group for information to support the preliminary design review (PDR), Jeff H. Smith has drafted an overview of robotic operations issues and conflicts affecting the Space Station. (An abridged draft is attached.) Paul Henry has written a similar overview covering issues related to orbital phasing for departures to Mars. Both reports are being provided to George Ganoe/LARC.

Evaluation of the change requests sent to JPL/Pasadena by Bob Glass/Reston are in progress. Jim Hendrickson/354 has completed a review of the "On-Orbit Factors of Safety" CR. Stan Krauthamer/342 is working on the "Electrical Power Specifications and Standards" CR. JPL/Pasadena will not comment on the "Baseline NIST X (Software) Window Standards" CR.

JPL/Pasadena Professional Development is offering a course in Superconductivity on 10, 11, 17 and 18 May 1990, from 8:00 am to Noon each day at the Embassy Suites, 210 E. Huntington Drive, Arcadia. There is no fee for the course. If interested, call Dan Duesler at 4-7906 for further details and/or registration.

Rob has a subscription to *Space Business News*. Anyone who wishes to be on the circulation list for this should contact Randy Cassingham.

Kristan Lattu and Dick Grumm continue to attend the lengthy OSSA Lab Support Equipment telecons. Rob expressed concern regarding extensive time spent at these telecons. Participation has been reduced to the minimum level required to be aware of issues important to prospective JPL laboratory experiments.

Chuck Ivie

Chuck will attend the User Ops Working Group meeting in Huntsville, Alabama on 15 and 16 May 1990.

During the week of 16 April 1990, Chuck attended program reviews for three SSF support systems in Houston, Texas:

1. The Preliminary Requirements Review (PRR) for the Integration, Test and Verification Environment (ITVE)
2. The Preliminary Design Reviews (PDRs) for the Data Management System (DMS)
3. The PDR for the Operations Management Applications System (the OMA is the software side of the OMS -- the Operations Management System).

The Integration, Test and Verification Environment (ITVE), as its name implies, provides an environment for the integration, test, and verification of systems, subsystems, and orbital replacement units that are intended for flight on the Station. The purpose of the ITVE is to provide assurance, prior to launch, that all elements will successfully interface, operate, and perform the functions for which they are designed. ITVE is the responsibility of WP-2 and is being conducted in Houston by an integrated team (under MDSSC management) consisting of MDSSC, IBM, Lockheed, and Honeywell. Though responsibility for the rules and tools for software development remain with the Software Support Environment the following has been transferred to WP-2:

- Simulation interface buffer design
- Simulation executive
- DMS-related simulations
- Environmental simulations
- User interface to support IT&V
- Tools to support IT&V
- Configuration management to support IT&V activity
- Simulations standards

In addition to the above, WP-2 IT&V scope has been increased to include End-To-End system engineering.

The ITVE appears to address a number of critical issues in the design lifecycle of SSF elements. It provides designers of Station subsystems with an environment where many interface and integration issues can be resolved well in advance of actual hardware installation, thus it has the potential to reduce costs and scheduling delays. However, the ITVE does not provide a means of evaluating the performance of the completely integrated system, nor does it address competition between various elements for limited resources. It does not appear to simulate the OMA at all.

The DMS PDR #3 addressed the DMS system, DMS kits, and delta hardware items. The DMS architecture overview was probably the most useful presentation of the DMS review from the perspective of end-to-end communications and data flow issues. It provided a clear understanding of the DMS architecture and connectivity at various stages of Station assembly and permitted an assessment of the services that the DMS provides and supports at each stage. The DMS does not, as presently construed, appear to have the capability to support the early assembly sequence. Telerobotic assembly operations, which some quarters appear to be counting on to alleviate heavy EVA demands, cannot be supported, or can only be supported to an inadequate degree, based on Chuck's understanding of the present DMS design. It is not clear how assembly data management requirements will be met.

The OMA onboard software system design does not appear to be adequately linked to the OMGA (Operations Management Ground Application) design, so the likelihood of their ability to interoperate has not been demonstrated. Chuck is unaware of any definitive specification of the OMGA.

Paul Henry

The Mars Trajectory Video Adventure, Part 3. JPL Audio-Visual has corrected the poor sound dubbing on the distribution copies of the video and is in the process of copying the video tapes...again. Paul is frustrated by the delay, but he hopes to distribute the copies soon.

Paul has been writing SRMs and performance reviews the last two weeks. The SRM for the EWG support in the planetary departures area is being processed.

The Stand-Alone Kit activities continue toward closeout at the end of June. Mark Sistilli/EM has not contacted Phil Cressy/EM or Bob Rhome/E yet regarding funding for the task; however, he has told Paul he will do so soon. Paul will be sending Sistilli an update on battery design and information about other off-the-shelf components which might be used in constructing the kit. Paul and Leigh Rosenberg/311 have found ways of reducing the unit's already-low cost, mainly by using existing NiCad batteries at a small mass penalty, instead of more efficient NiH batteries.

Sima Lisman

Gerry Murphy and Bob Laskin are on their way to Reston where they will promote Sima's Disturbance Simulation and Management Tool (DSMT) in connection with their other recommendations for software modelling tools they feel should be used for Station design.

Bob Easter told Rob that he has no problem with Sima's closeout plan for the DSMT task.

Hershal Fitzhugh

Fitz has received a copy of the McDonnell Douglas document, *Navigation and Control Handbook - A System Overview*.

Thursday, 10 May 1990, at 8:00 am, the Environmental Control and Life Support System videocon will take place in the Building 230 video conference room. It is a part of a series of videocons which have proven very instructive.

WP-01 is being readied for its PDR. Documentation is available for review in the Space Station Library (located at the IPC-Woodbury Complex in Building 601, Room 244Q). Contact Lori Paul for further information.

Fitz reported that MSFC has been planning to use the upgraded Spacelab payload mission operations software. To oversimplify, the planning process using this software for a seven day Shuttle mission takes two years. MSFC now wants to create software which supports more "real time" planning, but this will not be available until approximately the year 2000. Fitz and others feel that designers have yet to adequately face the fact that on average, for every calendar day of planning, 24 hours of workable plan must emerge. Paul reminded us of JPL's experience with Viking, where Orbiter and Lander operations essentially ground to a halt, old plans were discarded, and a new approach was implemented with much greater time and resource margins.

Lori Paul

Jim Jacobson (JPL/Pasadena) is still attempting to overcome the technical difficulties which prevent JPL connectivity to TMIS. Jim is expecting a response from CISCO and Ungermann-Bass in answer to some of his questions. He hopes to have their input by middle of May.

Randy Cassingham asked Lori to announce that he has investigated several NASAMAIL bulletin boards that relate to SSF. While most of them were empty, a few might be of general interest. One interesting board is JSC.STATION.TRAINING, which contains an on-line copy of a large Station training document. Listings of the contents of the JSC.STATION.TRAINING and the TRAIN.STATION boards are attached (note that, by example, they show how to access the boards). Other boards of possible interest: MAN.SYSTEMS.BB (crew Station review info); SS.SER (engineering review info); SSCB.STATUS (SSCB agendas and status info); SSE.BB (info regarding the SSEUWG [?] group); SSU.BB (Mission Integration Review info); and SSX (CSA [?] program status info).

For those with NASAMAIL boxes who wish to be notified when a bulletin board has been updated, investigate the SET command. After opening your NASAMAIL box, type HELP SET. Read about the SELECT.BOARDS option. Note: Access to the SET command may be restricted. If you are

denied access, call your NASAMAIL representative (at JPL/Pasadena: George Anderson at 4-5186) to get approval for using the SET command.

Upcoming Meetings

May 14-15: User Design Accommodations Working Group meeting at MSFC. Paul Henry and Hershal Fitzhugh to attend.
May 15-16: User Operations Working Group meeting in Huntsville. Chuck Ivie to attend.
May 21-25: Space Station Mission Planning Workshop in Huntsville. Hershal Fitzhugh and Wallace Tai to attend.
May 22-23: Fifth Conference on Artificial Intelligence for Space Applications in Huntsville. No one yet slated to attend.
May TBD: User Integration Panel meeting at MSFC. Rob Staehle may attend.
June 3-6: Case For Mars symposium in Boulder. Rob Staehle to attend.
June 20-22: First International Symposium on Measurement and Control in Robotics at JSC. No one yet slated to attend.
September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

AEROSPACE DAILY -- MAY 4

"WHITE HOUSE NEEDS 'MISSION TO REALITY' BEFORE MOON AND MARS: GORE"

"Before planning missions to the moon and Mars, the Bush Administration should attempt a "mission to reality" to come up with ways to pay the estimated \$500 billion cost, Sen. Al Gore (D-Tenn.) said yesterday."

The Gore remark, according to the Aerospace Daily, came during testimony on the NASA budget by Arnold Aldrich, associate administrator for aeronautics, exploration and technology, before the Senate's Commerce, Science and Transportation subcommittee on science, technology and space.

Gore told the hearing that "President Bush deserves enormous credit" for initiating the proposed 23 percent increase in the NASA budget, but predicted about \$1 billion would be cut from the \$15.1 billion request.

The Daily said Aldrich would not estimate the cost of lunar and Mars missions, but told the subcommittee money allocated in FY 91 would be used in part to develop program cost estimates.

Gore reportedly said while he supports the goals of the Administration initiative...other important NASA would have to be cut to pay for the moon-Mars programs.

House and Senate leaders that oversee the NASA budget met with the President and Vice President earlier this week to discuss space issues.

AEROSPACE DAILY -- MAY 9

"RESCOPING INCREASES STATION LIFE CYCLE COSTS BY \$1.3 BILLION"

"Space station life cycle costs through 1999 rose about \$1.8 billion because of program changes and stretchouts resulting from last year's rescoping effort a NASA official said Friday."

Quoting from comptroller Thomas Campbell, the Daily says the additional cost is due to an increase in the station contingency fund coupled with a less complex but more expensive stationkeeping propulsion system.

The Daily says Sen. Barbara Mikulski (D-Md.) supports a NASA program which includes the station but quotes her saying, "It is extremely unlikely that the subcommittee will have a sufficient allocation which will provide NASA with a nearly \$3 billion increase over last year."

POTENTIAL OPERATIONAL CONFLICTS FOR
THE EVOLUTION SPACE STATION FREEDOM:
ROBOTICS

J. H. Smith
05/01/90
ABRIDGED DRAFT

PURPOSE:

The purpose of this report is to provide an overview of robotic operations issues and conflicts pertinent to the Space Station Freedom.

This discussion is an overview of a very complex field composed of numerous disciplines. The problem must be divided into a series of issues which should be examined when considering the use or reliance on future robotic capabilities for mission operations. The terms "robot" and "telerobot" are used to characterize a machine of an unspecified level of autonomy.

If the designs are modified appropriately, there are potentially large impacts on the operations costs of the evolution station. The list of design conflicts for the PDR should be viewed as questions to the appropriate design groups.

1. Are there formal proximity operations rules?
2. How does the increasing length of the FTS "wrists" impact the FTS ability to operate in close quarters? It is not clear that the ORUs have been matched against the logical work systems most appropriate for performing their replacement. It would help to estimate the EVA and robot operations times (and their boundary values) for the purposes of EVA budgeting.
3. What level of robot operations can the SSF data and communications system support? Early indications are that the SSF comb system is insufficient to the task.
4. If the SSF is to be a transport node, will large robot cranes be needed, or can a strategy of docking large modules be developed? If using cranes, will the current truss support such stresses?
5. How close are robot capabilities to exceeding the dexterity of the glove? A quantifiable measure of performance is needed.
6. Are there any plans to place position location sensors in the truss members, laser ranging devices on robots, vehicles, and locations around the SSF for tracking precise location over time?

7. Are payload retention interfaces on STS, SIA, the servicing facility, the OMV (and other vehicles) standardized to minimize on-orbit reconfiguration requirements?
8. Are payload retention latches going to be remotely operated with manual over-rides to facilitate robotics? Are manual over-rides operable by robots?
9. If umbilical mating/demating devices are not built-in or automatic, are they located where space is available for access and manipulation?
10. Are robot retention fixtures available for anchoring the robot?
11. Are peripherals (lights, cameras) and foot restraints compatible for robot manipulation and installation?
12. Are there any plans for OMV servicing on SSF before returning to STS?
13. Dramatic advancements are anticipated in robotics computing technology over time. Will the SSF be capable of upgrading DMS capability over time or will a bottleneck evolve?
14. Will the use of flexible covers and tape be minimized/discouraged during operations because they are difficult for robot manipulation?
15. Is the ORU and tool storage area designed for robot compatibility?
 - (a) easy access by robots?
 - (b) docking points for robot stabilization?
 - (c) visual alignment guides for robots on ORUs, tools, and storage facilities?
 - (d) inventory control?
16. Is the development of EVA and robot tools being managed to maximize functionality and commonality, and minimize duplication? At the least, humans and robots should be able to stow and retrieve tools.
17. In various fluid and fuel replenishment scenarios, are manifolds and co-location of nozzles and connectors being used to the extent possible to enable robot operations? Are connectors and plugs standardized?

Comments to this draft are welcome. Contact Jeff H. Smith at JPL/Pasadena, Mail Stop 601-237; (818) 354-1236 (FTS 792-1236).

Command? check jsc.station.training

Now using bulletin board.

Command? scan all

Bulletin Board contains:

No.	Delivered	From	Subject	Lines
1	Apr 26 17:37	JLAPIN	SSTF LVA - 13.0 Station Environm	182
2	Apr 26 17:40	JLAPIN	SSTF LVA - 14.0 Support Software	182
3	Apr 26 17:53	JLAPIN	SSTV LVA - 15.0 Hardware Systems	1046
4	Apr 26 18:06	JLAPIN	SSTF LVA - 16.0 Ops Support Reqm	722
5	Apr 26 18:09	JLAPIN	SSTF LVA - 17.0 Facilities	107
6	Apr 26 18:17	JLAPIN	SSTF LVA - App A Definitions	290
7	Apr 26 18:22	JLAPIN	SSTF LVA - App B Acronyms	398
8	Apr 26 18:29	JLAPIN	SSTF LVA - List of Figures	79
9	Apr 26 19:11	JLAPIN	** Purpose of this board **	31
10	May 2 20:04	JLAPIN	SSTF LEVEL A - Contents	172
11	May 2 20:14	JLAPIN	SSTF LVA - 1.0 Introduction	74
12	May 2 20:18	JLAPIN	SSTF LVA - 2.0 Reference Docs	166
13	May 2 20:32	JLAPIN	SSTF LVA - 3.0 Goals, Assumption	752
14	May 3 12:00	JLAPIN	SSTF LVA - 4.0 Sim & Trng Enviro	821
15	May 3 12:05	JLAPIN	SSTF LVA - 5.0 IV&T Environment	182
16	May 3 12:09	JLAPIN	SSTF LVA - 6.0 SW Prod. Environm	106
17	May 3 12:24	JLAPIN	SSTF LVA - 7.0 USA Dist. Systems	1154
18	May 3 12:30	JLAPIN	SSTF LVA - 8.0 Intl. Dist. Syste	74
19	May 5 14:48	JLAPIN	SSTF LVA - 9.0 Robotics	184
20	May 5 14:55	JLAPIN	SSTF LVA - 10.0 External Interfa	287
21	May 5 16:07	JLAPIN	SSTF LVA - 11.0 USA Sponsored PL	182
22	May 5 16:10	JLAPIN	SSTF LVA - 12.0 NON-USA Spon. PL	182

Command? r 9

Posted: Mon, Mar 12, 1990 7:11 PM EST

Msg: VJJA-2870-4052

From: JLAPIN

To: JSC.STATION.TRAINING

Subj: ** Purpose of this board **

JSC.STATION.TRAINING is sponsored by the Space Station Training Branch of the Mission Operations Directorate (MOD) at Johnson Space Center (JSC). This bulletin board is intended for:

Schedules of Training Branch meetings/activities that may be of interest to other organizations in the Space Station Freedom Program, A directory of contacts within the Training Branch, and the major projects upon which they are working, Working documents, such as ICDs or portions of JSC-MOD requirements documents, Lists of reference materials (such as briefing packages or white papers)

One purpose for this board is to encourage the flow of information between JSC and MSFC as this information relates to the payload modeling and training tasks these centers will be facing. Information related to other subjects is encouraged!

To post information on this board, or for further information, contact one of the board administrators:

Jonathan Lapin
CODE DG53
NASA-JSC
Houston, TX 77058
(713) 283-5694

Mike Rodriggs
CODE DG52
NASA-JSC
Houston, TX 77058
(713) 283-5607

NASAMAIL(JLAPIN)
VMSPFHOU(NDG4JCL)

NASAMAIL(MARODRIGGS)
VMSPFHOU(NDG5MAR)

Command? check train.station

Now using bulletin board.

Command? scan all

Bulletin Board contains:

No.	Delivered	From	Subject	Lines
1	Apr 10 16:31	DWSCOTT	X.400 Test	2
2	Apr 10 17:02	DWSCOTT	PURPOSE OF THIS BULLETIN BOARD	37
3	Apr 18 15:10	DWSCOTT	Artificial Intelligence for Spac	42
4	Apr 26 12:49	RLOESH	Software Training Courses for SS	24
5	May 7 10:34	DWSCOTT	MAKE YOURSELF KNOWN!	15
6	May 7 10:42	DWSCOTT	Purpose of TRAIN.STATION Bulletin	37

Command? r 6

Posted: Mon, May 7, 1990 10:42 AM EDT Msg: SJJA-2882-2765
From: DWSCOTT
To: TRAIN.STATION
Subj: Purpose of TRAIN.STATION Bulletin Board

This is an open forum for sharing information on Space Station training ideas, issues, and activities.

Anyone can post a bulletin. Send NASAMAIL messages to TRAIN.STATION, or X.400 messages to (C:USA, A:TELEMAIL, P:NASAMAIL, O:NASA, UN:TRAIN.STATION).

Bulletins will be automatically purged after 30 days. If you want your bulletin removed before then, send a message to ADMIN/MSFC.

Bulletin topics may include but are by no means limited to:

- Meeting announcements and minutes
- Documents (or summaries thereof)
- Advances in training technology or techniques
- Issues of known or unknown interest to the training and user communities
- Requests for help on specific or general problems
- Responses to requests for help
- Commiserating on problems or rejoicing over solutions
- News from industrial and commercial training communities
- Travel schedules (so others will know when you're in town . . . IF you want them to know!)

Yes, the "train station" pun in the title is intended. Let's go somewhere!

P.S. - The JSC.STATION.TRAINING bulletin board also contains valuable information. Please let us know of any other training-related boards that already exist. If you see a need for a new training-related board, let's conference (via TRAIN.STATION, DWSCOTT, or JLAPIN) to make sure we (1) cover the right topics and (2) don't overpopulate the bulletin board community.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Arnett, James	521	301-466	4-9282		JArnett
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brunstein, Sam	334	300-243	4-2561		
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-???		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	183-401	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	

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Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	
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Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	264-648	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 101 (81 paper, 19 NASAmail) * Printed 10 May 1990

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-524

14 May 1990

TO: Distribution

FROM: Randy Cassingham *RC*

SUBJECT: SS Utilization Team Minutes for 14 May 1990

PRESENT: Rob Staehle, Randy Cassingham, Dick Grumm, Chuck Ivie, Bob Laskin

Next Meeting: 21 May 1990 at 10:30 in 301-271

Rob Staehle

Paul Henry's Level I Utilization Plan task was approved by Carolyn Griner/MU to be performed for Remer Prince/MUU. Paul and Rob will meet with Barry Epstein/MUU in Huntsville tomorrow to start the task.

In a speech last week, President Bush set a timetable for a human landing on Mars: before the 50th anniversary of the moon landing (July 2019, for those weak on math). Rob hosted Chris McKay and Carol Stoker from Ames on Friday for a discussion on mission strategies, vehicle assembly in orbit, and the upcoming Case for Mars-IV conference. Excerpts from the speech are attached.

In the continuing reorganization of NASA HQ Codes, Code E is now Code S (e.g., Code EN is now SN); Code L is now Code P.

Randy Cassingham

Randy has been working full time to get the final-final draft of the *Introduction to Utilizing Space Station Freedom* document finished; Code MU has resuscitated this task now that the Station baseline has somewhat stabilized. The task is on track for the review draft to be delivered at the end of this month.

While Lori Paul has been doing the meeting minutes memo for the last several weeks, Randy is still assisting, and is still taking care of the distribution list. He asks that anyone not getting the minutes via NASAmail that would be willing to get them in this matter (hey: it's faster!) to please let him know. The distribution is over 100 again, including 81 paper copies. Your assistance in cutting down the decimation of the forests (and Randy's secretary's time) would be appreciated.

Richard Grumm

Dick has been attending numerous Laboratory Support Equipment (LSE) telecons in the past several weeks. The participating group is an interesting mix of Station developers and payload scientists. The telecons have broken down many of the barriers that have developed between the Work Packages and the scientists, but the conferences go on for very long periods (sometimes four to six hours).

The bottom line from the telecons: the payload scientists are trying to remove (and the Work Package contractors are trying only to defer) much of the on-board analysis equipment (e.g., the scanning electron microscope, x-ray diffraction crystallography tools, and cutting, polishing and etching equipment). Basically, the argument is that the Station should not provide *analysis* services (which use an extensive amount of crew time), but should spend more time getting more samples for Earth-based analysis. One concern: some of the analytical equipment is extremely complex and skill-intensive; many scientists might not "trust" the crewmembers to do the analysis correctly. Also, the

scientists are concerned about equipment costs. Chuck Ivie was quite interested in this development: if many complex lab instruments are deleted, it might have a significant impact (i.e., reduction) on data transmission requirements. Dick will send Chuck any reports or papers that deal with this.

Kristan Lattu is doing most of the contact for JPL's participation in these LSE telecons; Dick pipes in (with his payload developer viewpoint) as necessary. Dick notes that Kristan is good at finding the logical conflicts in what others are saying and bringing them up for discussion; she's a good listener.

On another front: a WP-01 PDR handout was delivered to Bob White, who is still listed as the JPL Science Utilization Management (SUM) team representative. The "handout" consisted of nine boxes of documents; Bob promptly "resigned" as the SUM rep, and passed the boxes on to Hershal Fitzhugh, who passed them on to the Space Station Documentation Library in Building 601. Dick notes that the amount of paperwork being generated is a real problem: isn't there some sort of alternative, such as CD-ROMs? How can the wheat be separated from the chaff when so much paper is involved?

Bob Laskin

Bob and Gerry Murphy have coordinated JPL's input to various environmental issues for Code MS/Level II. They were at HQ last week to meet with Dick Williams/MSU, Dana Brewer/MSE, Joe Sullivan/SSEIC and several others, both in person and by phone, to discuss a consolidated approach. The plan was well received. Bob and Sima Lisman's Disturbance Simulation and Management Tool was one of the line items in Gerry's plan. They met privately the next day with Williams and his technical staff and demonstrated the DSMT; Williams already has the go-ahead from his management to provide FY90 and FY91 funding for further development of the tool. This is enough to make up for most of the JSO funding which will stop June 1 or shortly thereafter. Bob expects to deliver a beta-test version this year; version 1.0 will be delivered next year; this amounts to a schedule stretch-out resulting from a reduced spending rate.

Bob and Gerry also met with Gregg Switek/MT: he seemed interested in the DSMT to some extent, and may provide some funding for next year.

Chuck Ivie

Chuck will be near Washington both this week and next, first meeting with Mike Devirian and Bob Vuolo/JSO to prepare for the next week's Baseline Advisory Group (BAG) meeting.

Finally, Rob received the following interesting press release:

HEAVIEST ELEMENT DISCOVERED

The heaviest element known to science was recently discovered. Tentatively named Administratium (Ad), it has no protons or electrons (thus, an atomic number of 0), but does contain one neutron, 75 associate neutrons, 125 deputy associate neutrons, and 111 assistant deputy associate neutrons, giving it an atomic mass of 312. These 312 particles are held together in the nucleus by a force that involves the continuous exchange of meson-like particles called memo-ons.

Since it has no electrons, Administratium is inert. Nevertheless, it can be detected chemically because it seems to impede every reaction in which it takes part. A very small amount made one reaction that normally takes seconds take over four days to go to completion.

Administratium has a half-life of three years, at which time it does not actually decay, but rather undergoes an internal reorganization in which associates to the neutron, deputy associates to the neutron, and assistant deputy associates to the neutron all exchange places. Some studies have indicated that the atomic mass actually increases after each such reorganization.

Upcoming Meetings

May 14-15: User Design Accommodations Working Group meeting at MSFC. Paul Henry and Hershal Fitzhugh to attend.

May 15-16: User Operations Working Group meeting in Huntsville. Rob Staehle will attend a portion.

May 17-18: User Integration Panel meeting in Huntsville. Rob Staehle may attend a portion.

May 21-22: Space Station Furnace Facility Workshop at MSFC. Dick Grumm to attend.

May 21-25: Space Station Mission Planning Workshop in Huntsville. Hershal Fitzhugh and Wallace Tai to attend.

May 22-23: Fifth Conference on Artificial Intelligence for Space Applications in Huntsville. No one yet slated to attend.

May 22-24: Baseline Advisory Group (BAG) meeting at NASA HQ. Chuck Ivie to attend.

May 23-TBD: Laboratory Support Equipment RIG final meeting at MSFC. Kristan Lattu to attend.

June 3-6: Case For Mars symposium in Boulder. Rob Staehle to attend.

June 20-22: First International Symposium on Measurement and Control in Robotics at JSC. No one yet slated to attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code L's "Daily News in Brief" (Typos not corrected...)

ASSOCIATED PRESS -- MAY 11

"NASA should buy at least one more space shuttle because there's a 50-50 chance a craft will be lost in the next several years, a congressional report suggested today."

The AP says the Office of Technology Assessment, in a report issued today, states that the NASA goal of 14 shuttle launches a year poses increased risks to astronauts and by limiting the flight schedule to missions requiring human presence, the flight rate could be cut to eight to 10 flights a year.

AP says OTA reports a 50-50 chance of losing an additional orbiter in the next 34 flights if the shuttle reliability factor is 98 percent and that a replacement orbiter would cost from \$2 to \$2.5 billion.

UNITED PRESS INTERNATIONAL -- MAY 11
"REPORT URGES FOCUS ON U.S. SPACE PROGRAM"

"The United States must chart a more specific path for the future of the space program before making major decisions about building new types of spacecraft, a report concluded Friday."

UPI says a report filed today by the Office of Technology Assessment calls for "a national dialogue ... to establish the future course of the publicly supported space program and to outline the preferred means of accomplishing the program goals."

The UPI quotes from the report saying "it is not sensible to choose among space transportation options without first selecting the specific goals to be served."

The wire story says OTA offers several options, including: building improved expendable rockets; limiting the shuttle flights to eight to 10 a year; building additional shuttles; improving the safety and reliability of the current shuttles; developing a crewless shuttle (Shuttle-C); increasing international cooperation in space; using European and Japanese launch vehicles to supply the space station; cooperating with the Europeans, Japanese and Soviets in crew rescue efforts; and joint development of an aerospace plane.

UPI ends with a response to the report from Rep. Robert Roe (D-NJ), "this nation stands at a crossroads in its civil space program. I believe we should take the high road -- complete the space station Freedom on schedule and then begin to reach out beyond our planet to explore the moon and Mars, and eventually begin to use these new frontiers for both scientific and economic gain."

USA TODAY -- MAY 9

"AN OUT-OF-THIS-WORLD SEX DRUG? IT'S JUST A DREAM" by Elizabeth Snead

"Rumors of a brand new drug are rocketing coast to coast. Hip-hopping Digital Underground named their hot new album 'Sex Packets' for a drug that supposedly induces orgasmic dreams."

USA Today reports that Digital Underground's press packets say "Sex packets" were devised by a doctor for NASA to 'satisfy astronauts' sexual appetites during space travel."

"Nonsense, says NASA." NASA life science official Mel Averner is quoted saying, "Number one, it would be impossible to satisfy the carnal urges of astronauts; and number two, to my knowledge, unbridled lust has never interfered with a space mission ... NASA has not in the past, nor will they in the future, be working on such a pill."

"You do know it's just a fantasy, don't you?" USA Today concludes, quoting Digital Underground's New York spokesman Bill Adler.

AEROSPACE DAILY -- MAY 14

"ISF REVISITED"

"Unless NASA can resolve expected microgravity disturbances aboard the Space Station, it will have to reconsider plans for a free-flying microgravity lab that were rejected last, says Gil Keyes, president of Boeing Commercial Space Development Co."

The Daily quotes Keyes saying "I think the idea of a free-flyer will resurface," and notes that Boeing invested \$3 million of its own money as a junior partner in Space Industries's Industrial Space Facility.

AEROSPACE DAILY -- MAY 14-20

"TRULY: INSTITUTIONAL FUNDING WILL HEAD NASA PRIORITY LIST" By Andrew Lawler

"NASA Administrator Richard Truly singled out the agency's accounts for personnel and aging facilities as the most important elements in its 1991 budget request during testimony before a Senate panel May 4."

The weekly reports that Truly's statement marks an important turning point for the agency, which traditionally has pressed Congress more enthusiastically for hardware programs rather than institutional needs. Lawler says congressional staffers and NASA officials indicated the lack of money for agency civil service staff threatens to undermine the ambitious program NASA has underway.

Quoting from Truly's presentation, the weekly continues, "Our highest priority is simply to make sure that NASA continues to have the facilities and people to do our job."

The story concludes with a Truly comment to the Senate subcommittee which oversees the agency, citing Congress's "talking about American competitiveness" but cutting the budget requests for technology programs at NASA centers, universities and industry.

Excerpts from the Text of the Remarks by the President
in Texas A&I University Commencement Address

Texas A&I University
Kingsville, Texas

May 11, 1990

Together, these objectives form the cornerstone of my Administration's far-reaching plan for investing in America's future. Our space program will help rekindle public interest in science and mathematics, and revitalize an area of our educational system that has become disturbingly weak. In fact, one of the education goals we announced in January is to make the United States first in math and science by the year 2000. But our space program will do more. It will revolutionize everything from computers to communications, from medicine to metals, regaining and retaining America's high-tech competitive edge. It will create new technologies, new industries, and new jobs.

But the importance of the space program — especially the manned space program — goes deeper than that. Throughout our history, America has been a nation of discoverers. It is part of our national character — part of our democratic heritage. In fact, Monday marks the day in 1804 when Meriwether Lewis and William Clark set out across the Mississippi to map much of what was to become the great American West. Despite Thomas Jefferson's love of machines — it's hard to imagine his sending a robot out alone to describe the wonders of the American Rockies and the Pacific coast. In the American experiment — in the experiment called democracy — there will always be a place for individual men and women with imagination and daring.

Our Nation's quest for the unknown took American pioneers from the bluffs of the Mississippi to the mountains of the Moon. But today, we're no longer just asking for the Moon. We've been there. We're looking further, to carry the American adventure to wherever opportunity, curiosity, and need will take us.

It's time to open up the final frontier. There can be no turning back. America's space program is what civilization needs to begin this journey, and to perfect the commitment to go beyond. Each time we go to the frontier and beyond, we bring back more than we hoped for. This time we have the chance to bring back more than we can imagine. Our 1991 budget is proof positive of America's commitment to an active, exciting and continuing presence in space — to America's leadership in space. Our budget proposes \$15.2 billion for NASA, an increase of 24 percent — almost \$3 billion — which is the largest increase for any major agency of the government.

But leadership in space takes more than just dollars. It also takes a decision. And I'm announcing one today.

We stand at a halfway point in our exploration of the immediate solar system — the planet Earth, its Moon, and the terrestrial neighborhood. Thirty years ago, NASA was founded and the space race began. And 30 years from now I believe Man will stand on another planet. And so I am pleased to return to Texas today to announce a new Age of Exploration, with not only a goal but also a timetable: I believe that before Apollo celebrates the 50th anniversary of its landing on the moon — the American flag should be planted on Mars.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Arnett, James	521	301-466	4-9282		JArnett
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brunstein, Sam	334	300-243	4-2561		
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	183-401	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	

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Levin, Dick	311	601-237	4-1253		
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204			MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
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Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 102 (82 paper, 19 NASAMail) * Printed 15 May 1990

R. Cassingham

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-526

21 May 1990

TO: Distribution

FROM: Lori Paul

SUBJECT: SS Utilization Team Minutes for 21 May 1990

PRESENT: Rob Staehle, Bing Chen, Paul Henry, Chuck Ivie, Stan Krauthamer, Sima Lisman, Lori L. Paul

Next Meeting: 4 June 1990 at 10:30 in 301-271

Rob Staehle

In the continuing reorganization of the NASA HQ "Codes", the following changes in Headquarters Organization Designation were made recently:

Former Code(s)	New Code	Title
S and M	M	Office of Space Flight
T	O	Office of Space Flight Operations
E	S	Space Science Application
U	E	Equal Opportunity
R and Z	R	Aeronautics Exploration and Technology
L	P	Public Affairs
X	L	Congressional Liaison
X	X	International Affairs

The Spacecraft Dynamic Environment Technical Interchange meeting will be held 19-21 June at Aerospace Corporation in El Segundo, California. Contact Dennis Kern at 4-3150 if interested in attending.

Rob attended portions of the User Operations Working Group (UOWG) and User Integration Panel last week in Huntsville. The viewgraph presentation package, "International Standard Payload Rack (ISPR) Utility Interfaces," is available from the Space Station Library, call Lori Paul at 4-1166 to arrange a loan. European user services planning is proceeding well, though it is complicated by the political need to distribute facilities among several nations. In a U.S. presentation that was well received by ESA attendees, it was stated that the Payload Operations Integration Center (POIC) would be staffed by NASA, Canadian, European, and Japanese specialists.

Mac Reid/100 has been appointed to a "blue-ribbon panel" which will review the Science Applications International Corporation (SAIC) response to the Fisher/Price study of Space Station EVA maintenance requirements. Rob met with Mac to update him on the issues involved. Rob, Jeff L. Smith, and Bob Shishko/311 provided background information. Chuck Ivie, Wayne Schober, Jeff H. Smith, and certain Reston personnel are also expected to support Mac Reid while he serves on the panel.

Rob and Paul Henry met with Theresa Maxwell/MSFC and Ann Bauer/Teledyne Brown in Huntsville last week. They are helped organize the Mission Planning Work Shop that Kristan Lattu and Hershal Fitzhugh are attending this week.

A copy of the 5 March 1990 minutes of the Environment Steering Committee Meeting (distributed by Ed Reeves/M) is available for review. Included are viewgraphs by Mark Sistilli/SM ("Effects of the Induced External Environment on Attached Payloads") and Dr. Lubert Leger/JSC ("Update to Level II/III External Contamination Control Activities"). Contact Lori Paul at 4-1166 to obtain a copy of the minutes.

Stan Krauthamer

Stan Krauthamer/342 reported on the status of two Change Request (CR) evaluations:

1. Stan completed and delivered a verbal assessment of a recent CR to Rob Koontz/Reston. The CR involved power requirements and other characteristics affecting the logistics module and material transport.
2. Stan expressed concern regarding the "Electrical Power Specifications and Standards" CR. The CR is acceptable on the surface, but it raises several important design issues. Focusing solely on the evaluation of specifications in the CR may be ignoring more global problems involving overall electrical system design. Stan suggests that the issue of electrical grounding on the Station be investigated more thoroughly. The use of a positive primary bus ground may adversely impact system reliability by placing additional stress on the DDCUs (the DC to DC unit converter interfaces between primary and secondary distribution). Current electrical system designs for the Station may experience a large amount of power dissipation in the secondary power distribution bus due to multiple RPCs (remote power controllers) in series (as many as four), which are associated with power losses (through junction losses, cable loss, etc.) Improvement may be possible using latching relays in some locations.

Paul Henry wanted to know if a positive or negative ground had been chosen for the Station. To Stan's knowledge, current designs give the primary bus a positive ground and the secondary bus a negative ground. Chuck Ivie expressed concern over this situation and wanted to know how the grounding conventions would affect a docking Shuttle. Stan indicated that with currently planned isolated single point grounding, shuttle docking might not be a problem. The structure itself is not grounded. In the future, a specification on grounding will be established and made available for review. Stan should be asked to evaluate it. Also, Gerry Murphy/521 should review the specification from an electromagnetic interaction/electromagnetic compatibility (EMI/EMC) standpoint.

Stan will mention some of these design concerns in his final evaluation of the "Electrical Power Specifications and Standards" CR. His comments on the CR will be submitted to Bob Glass/JSO Program Evaluation Division by the 26 May 1990 deadline. Stan also hopes the design issues will be addressed in greater depth during the upcoming Electrical Power System PDR and the final CDR (Critical Design Review).

Paul Henry

The Mars Trajectory Video Adventure, Part 4. The video has been successfully distributed! Favorable reviews have begun to arrive.

The standard rack issue was discussed extensively at the last UDAWG meeting. At a recent international Partner meeting in Tokyo, a consensus was reached on standardizing Station racks. The large, 80 inch rack was selected. Paul felt that real progress was finally being made in resolving rack issues. A "sub-rack" standard at the panel level has been proposed. A mock-up of a sub-rack was presented at the UDAWG meeting. Canada is strongly encouraging, through the CR process, standardization of sub-rack size and design.

Rob heard some time ago that the three Partners responsible for building Station modules have finally agreed to standardize the diameters of the modules. Rob has not confirmed this assertion and has no details regarding module dimensions.

Paul highlighted the current status of user CRs selected from a viewgraph package presented at the 15 May UDAWG meeting by Richard J. Williams/MSU. See copy of the CRs attached to the minutes.

In Huntsville, Paul and Rob met with Barry Epstein/MUU to discuss the Level I internal operations plan task for Remer Prince. Paul will prepare a POP for the task.

Mark Sistilli/SM is at NASA Headquarters Code S presenting the Relocatable Utility and Communications Stand-Alone Kit (RUCSAK) concept to Bob Rhome/S. If Rhome is interested, a Phase A study of the Stand-Alone Kit will be proposed. (Update: Rhome has decided to consider RUCSAK again after the PDR. The task will be officially closed out on 27 May.)

Bing Chen

The United States Microgravity Lab (USML) - 3 Mission's Drop Physics Module (DPM) - 3 is intended for operation first aboard Spacelab in 1996, then on the Space Station in the Modular Containerless Processing Facility (MCPF). Mechanical modifications may be required to move from Spacelab to Space Station Freedom. DPM - 3 will be built for 28 VDC Spacelab power. The Space Station will supply 120 VDC. Paul said there was discussion at the UDAWG of a 120 to 28 volt converter at the base of some racks, but it may have a less than 1.5 kilowatt power limitation, while DPM is designed to draw more power at certain times.

Sima Lisman

Bob Laskin is working on a CR evaluation regarding base body pointing knowledge.

The program description and the User's Guide for the Disturbance Simulation and Management Tool (DSMT) are in production.

Sima is preparing a paper about the DSMT which will be presented at the AIAA Guidance and Control Conference in Portland, Oregon during August.

Sima was expecting a report from Gerry Murphy regarding Level II acceptance of the "Space Station Environments" task package, of which DSMT is a part.

Lori Paul

Jim Jacobson/372 has not yet received a response from CISCO or Ungermann-Bass regarding the technical problems preventing JPL-to-TMIS connectivity. He hopes to have their assistance soon.

Lori presented the status of two task closeout plans. The Pressurization Study task closeout has been delayed to 31 May 1990. (Lori will contact Kim Aaron to obtain a progress report.) The Integration, Test, and Verification task closeout has been completed. Warren Moore/374 has prepared a cover letter and report, which will be distributed on 22 May.

Chuck Ivie

Chuck spoke with Larry Alberts, Stan Fishkind/MI, and Gregg Switek/MT on the issue of generating Station information system models in a common language. Inputs for FROST could then come directly from the requirements model, the ACDs, and services model. Chuck discussed FROST and concerns about the compatibility of the model languages with Alan Webb/JSO.

Chuck will attend a meeting of the Baseline Advisory Group (BAG III) has been scheduled for Thursday, 24 May at NASA Headquarters. Video links to JSC and Marshall will be provided.

Upcoming Meetings

May 21-22: Space Station Furnace Facility Workshop at MSFC. Dick Grumm to attend.
May 21-25: Space Station Mission Planning Workshop in Huntsville. Hershaf Fitzhugh and Wallace Tai to attend.
May 22-23: Fifth Conference on Artificial Intelligence for Space Applications in Huntsville. No one yet slated to attend.
May 22-24: Baseline Advisory Group (BAG) meeting at NASA HQ. Chuck Ivie to attend.
May 23-TBD: Laboratory Support Equipment RIG final meeting at MSFC. Kristan Lattu to attend.
June 3-6: Case For Mars symposium in Boulder. Rob Staehle to attend.
June 20-22: First International Symposium on Measurement and Control in Robotics at JSC. No one yet slated to attend.
September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos not corrected...)

SAN FRANCISCO CHRONICLE -- MAY 14

"A RADICAL PLAN TO GET U.S. TO MARS IN 8 YEARS" By Charles Petit

"To rocket Americans back to the moon four years from now and on to Mars in eight years would seem an impossible -- and impossibly expensive -- chore."

The nearly-full page feature story focuses on the efforts of three Lawrence Livermore National Laboratory scientists to develop a lunar and Mars mission capability using inflatable modules for a cost of \$11 billion, versus the expected \$400 billion for the NASA plan.

Petit describes a meeting called at Livermore to discuss the details of such a plan to representatives of the aerospace industry. The Chronicle says the lure was the possibility of future contracts being let by the Department of Energy and the University of California to design space stations, rockets, fuel tanks and housing modules -- all of which would be inflatable.

The story says NASA is opposed to the plan and has found it to "have a very high probability of not working as assumed." But, the story also says the Livermore plan has a sympathetic audience at the National Space Council and the California group has a good chance at pursuing these ideas.

AVIATION WEEK -- MAY 21-27

"DAMAGED SOYUZ SPACECRAFT PUTS COSMONAUTS AT RISK" By Craig Covault

"The Soviet Soyuz manned transport docked to the Mir space station has been damaged, leaving the two cosmonauts on board the Mir without a reliable escape vehicle in the event of an emergency."

AvWk says the cosmonauts are preparing for an emergency space walk to attempt repairs on the Soyuz, now orbiting 200 miles up.

Covault says Soviet photos shown him indicate the thermal blankets on the Soyuz TM-9 descent module have been ripped away from the spacecraft's metal skin causing a serious reduction of interior temperatures and blocking important navigation sensors.

The magazine also cites Soviet concerns that thermal-related interior vapor condensation might short-circuit important electrical systems.



Status of Space Station Freedom User's Change Requests

Date: 05/03/90



Level	Title	Description	Change Request No.	Level I/II Disposition Status	Notes
II	Payload Late & Early Access and Transportation	Enables major non-human life science & biological material science research in uncompromised environment	BB000339A (Note new 339B) OSSA CR No. 33 to Level II OSSA CR No. 62 to Level II	- Level II - BB000339B SSCB schedule 6/27/90	-CR for refrigerator/freezers released as BB000399B -Letters for Mid-deck released 4/15/90 (Code S to M)
I	Microgravity Environmental Acceleration Levels	Changes frequency limit and allows increasing g between 0.1 and 100 Hz	HE900031 OSSA CR No. 34 (R)	Closed	Level I directive signal 1/19/90
II	Microgravity Environments	Enables adequate materials processing and other Micro-G experimentation to be conducted on SSF	BB000610 OSSA CR No. 32 to Level II (R)	Closed	Level II directive Signed 3/26/90
I	SSP Additional Attached Payload Accommodations	Increases number of attached payload resource ports to 8 and APAE's to 4, provides for SARRs, small payloads, distributed payloads 9	HE900046 OSSA CR No. 72 (R)	Level I - pending Level II assessment	Access with BB000617 Approximately 6 weeks after release

Note: (*) Decision notices not signed
(W) Withdrawn (R) Revised

I-13A

Status of Space Station Freedom User's Change Requests (Cont'd)

Date: 05/03/90



Level	Title	Description	Change Request No.	Level I/II Disposition Status	Notes
II	Additional Major APAE Utility Resource	Adds ports; enables attachment of major P/Ls on any available truss face; dedicated to major, long-term payloads; accommodates Code R & C payload requirements	BB000617	Level II - in work	Combined CR (BB000617/618) prepared. In MSS for preliminary assessment. Scheduled for 5/19/90
II	Attached Payload Accommodations	Allocates truss to support major and minor attached P/L's. Specifies associated resources and viewing. Adds two APAE to baseline. (Replaces BB000617 and BB000618)	TBD	Level II - in work MSS	Scheduled for 5/19/90 release
I	Small and Rapid Response Payloads	Clarification of SARRs	HE900047 (*) OSSA CR No. 73	Level I - approved pending Level II assessment	Assess with BB000618 Approximately 6 weeks after release
II	Small Attached Payloads Including PIMs	Small attached payloads greatly increase utilization of Station; enable high priority rapid response payloads; supports student and commercial research opportunities	BB000618	Level II - combined with BB000617 as single CR	
II	Distributed Sensor Payloads (Structural Characterization Experiment)	Enables characterization of SSF structural dynamics and modeling techniques for large space structures	BL060010	Level II - in work by MSS	Action transferred to MSS lead BL060010 study completed with draft CR Review scheduled 6/10/90

Status of Space Station Freedom User's Change Requests (Cont'd)

Date: 05/03/90



Level	Title	Description	Change Request No.	Level I/II Disposition Status	Notes
I	Additional Payload Definitions for Appendix D	Adds SARR definitions to Appendix D	HE900048 OSSA CR No. 74 (R)	Level I - approved with modifications pending Level II assessment	Assessment due with BB000618; approximately 6 weeks after release
I	Addition of Truss Extensions to the Space Station Program-Provided Attached Payload	Provide for truss extensions for some OSSA payloads	HE900044 OSSA CR No. 55 (R)	Level II - Accepted	Assessment completed- can accommodate, No Level II changes needed. Enabling language in attach Payload Accommodation CR.
I	SSMB Unpressurized External Storage Volume	Adds environmental control to unpressurized storage	HE900042 (*) OSSA CR No. 50 (R)	Closed. Rejected	MSU-3 assessing storage requirements and capabilities for possible changes data due 5/3/90
II	High-Rate Data Handling	1 GBPS point-to-point connections	BB000612B	Level II - CR's submitted SSCB rescheduled 5/30/90	CR BB000641 to section 3 submitted

Status of Space Station Freedom User's Change Requests (Cont'd)

Date: 05/03/90



Level	Title	Description	Change Request No.	Level I/II Disposition Status	Notes
II	Remote Switching and Routing Equipment	Media transport of high-rate data onboard	BB000613B OSSA CR No. 29 to Level II	CR's submitted SSCB - TBD	CR BB000642 to section 3 submitted
II	Buffer Storage Capacity for Payloads	Insures storage capabilities are provided	BB000616B OSSA CR No. 30, 28 to Level II	CR's submitted SSCB - TBD	CR BB000643 to section 3 submitted
II	Data Downlink	Maximum 250 megabits for payloads	BB000614B	CR's submitted SSCB - TBD	CR BB000640 to section 3 submitted
II	Video/Image Analysis Processing	Capability video image processing	BB000615B OSSA CR27	CR's submitted SSCB - TBD	CR BB000637-639 & BB000635 to section 3 submitted
II	Latency Requirements	1.25 secs: payload data to ROC or DOC or UOF	BB000611B	CR's submitted SSCB - TBD	CR BB000644 to section 3 submitted
I	Telecontrol	Expands scope of "tele-control"	HE900043 OSSA CR41	Level I - approved	No Level II impact
I	Maintenance of crew skills between increment assignments	Provides maintenance of skills between reflight intervals (2-1/2 years)	HE900035 OSSA CR39	Level I - disapproved Level II - disapproved Evaluation (12/12/88)	Closed
I	Commercial Emphasis	Several CRs from Code C have been combined (HC900003-900011)	TBD	Approved 1/11/90	Closed

Status of Space Station Freedom User's Change Requests In Work

Date: 05/03/90



Level	Title	Description	Change Request No.	Level I/II Disposition Status	Notes
II	Laboratory Support Equipment	Additional items and specifications added to LSE	CR TBD OSSA CR No. 53 to Level II (W)	Level II - in work at WP01	Commonality completed 3/30/90. WP-01 to develop CR using RIGS. Due 5/29/90
II	Optical Windows	Provide viewing for +x, -x, +y, -y, +z, and -z. Minimum quality of Skylab S190A windows	BB000540 (Revised)	Level II - in work	MSS/MSU study initiated due 7/2/90
II	User Rack Utilities in Lab - Hardware/Software Commonality	Describes utility accommodations of user racks in U.S. Lab, ESA APM, and JEM	CR TBD OSSA CR31	BB000669 - withdrawn pending MSS submission	User requirements CR develop 3/20/90 Released 4/12/90. MSS CR in pre-review. Release scheduled 5/15/90
I	Update the NPOP-1 Altitude	Removal of NOAA payloads from NPOP. Previous orbit requirements no longer exist	HE900050 OSSA CR No. 70-03	(User deferred)	
II	Induced Environment and Grounding	Identifies new user requirements based on rephased configuration	CR TBD	Closed. User have withdrawn requirement.	Cost received from WP2 and WP4. User requirement for positive ground and plasma reference withdrawn. Note: $\pm 2v$ reference still required

Status of Space Station Freedom User's Change Requests In Work (Cont'd)

Date: 05/03/90



Level	Title	Description	Change Request No.	Level I/II Disposition Status	Notes
I	Payload Data Rate	Increases data rate at each double rack	HE900032 OSSA CR35	(User deferred)	Included in BB000612B
I	SSIS Data Network onboard Data Storage Capacity	Provides data buffering to reduce load on restricted downlink capability	HE900037 OSSA CR42	(User deferred)	Included in BB000643
II	SSMB Data Handling On-Board Storage Capacity		HE900033 OSSA CR36	(User deferred)	Included in BB000643
I	Centrifuge Accommodation	Provide for 2.5 meter centrifuge in node	HE900053	Level I - approved with modification	Accept 2.5 meter Level II to access implementation
II	Centrifuge Accommodation	Provide for 2.5 meter centrifuge in node	BB000625 OSSA CR 92	Level II - approve with modifications	Accept 2.5 meter study location - completed 4/6/90. In management review
II	Base Body Pointing knowledge	GN&C to provide pointing information to P/L's	BB000687	Level II - SSCB scheduled 7/18/90	
II	POP requirement deletion	Removes POP requirement, Sec. 5	TBD	Level II - In work	Due 5/31/90



Status of Space Station Freedom Utilization Change Requests (Section 5 to Section 3 PDRD)

May 4, 1990



Title	Description	CR. No.	Status/Disposition	Notes
Internal Payload Servicing and Repair	Program Support for P/L Maintenance & Repair		Draft/Hold	Resolve with LSE Co-ad with Maintenance 5/31/90
Laboratory Outfitting	Sub-Rack P/L Accommodations		Draft/Hold	Action: UDAWG Provide Drawer Requirements
Logistics	Defines Services of ILS		Draft/Hold	In Review Logistic
Resource Node Outfitting	Node Outfitted for P/L's		Draft/Hold	Centrifuge Study Results Needed
MTFF Transport and Handling	Add MTFF as Specific Free Flyer		Draft/Hold	Prox Ops Evaluation Needed
User Supplied Pressurized Module	Add Capability to Support		Draft/Hold	Berthing Analysis Needed
Laboratory Rack	60 P/L Racks Plus Storage		Draft/Hold	Working in Resource Allocation. Due 6/1/90
Assembly Complete Upmass	77,000 lbs. for P/L		Draft/Hold	Working in Resource Allocation. Due 6/1/90
Jitter and Stability	Places Appropriate Valves (≤ 0.025 and ≤ 0.5 degrees) in PDRD			Working in Resource Allocation. Due 6/1/90

Status of Space Station Freedom Utilization Change Requests (PDRD/PDR)

May 4, 1990



Title	Description	CR. No.	Status/Disposition	Notes
User Upmass	40 % of "usable Upmass when no assembly activities" to PDRD		Draft/Hold	Logistics Assessing
Inertial Knowledge	1 ^o Requirement to PRD	TBD	Submitted to Level II Management 4/20/90	
SARR and APAE	Attached P/L's Capabilities to PRD & PDRD		MSS Assessing Due 5/15/90	See BB000617/618
User Crew Time	All crew above 2 and IVA of 5000 hrs/yr with a crew of 4 to PDRD		Draft/Hold	Work in Resource Allocation Due 6/1/90
Data Down	250 mbs user data to Ground PRD			Assess after Level II data CR's

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-530

4 June 1990

TO: Distribution

FROM: Randy Cassingham

SUBJECT: SS Utilization Team Minutes for 4 June 1990

PRESENT: Paul Henry, Randy Cassingham, Sima Lisman, Dick Grumm, Kristan Lattu

Next Meeting: 18 June 1990 at 10:30 in 301-271

Paul Henry

Rob Staehle is on travel this week. Note that next week's meeting has been canceled due to travel.

Rob has been appointed as the Manager of Space Station Freedom Support Office Pasadena Operations to serve as "a single focal point in Pasadena for all SSFSO activities at JPL. This includes tasks sponsored by the Reston JPL Systems Office, delegated 'pass-through' tasks from other portions of the program, coordination of Space Station Freedom program detailees and informal coordination with other Space Station-related activities at JPL." This formalizes duties Rob has been doing in the past. The current SSFSO/JSO Organization Chart is attached.

Several papers have arrived in the last few weeks; they will be in the Space Station library in building 601 (library contact: Lori Paul):

- *Columbus Model Payloads and Reference Missions* (from ESA)
- *Final Report -- Space Station Freedom Verification Assessment* (from Section 374)
- a "Final Report Update" to *Space Station Freedom External Environmental Requirements* (2 volumes; from McDonnell Douglas/GSFC).

Randy Cassingham

The "Final Approval Draft" of the document *Introduction to Utilizing Space Station Freedom* was sent to Headquarters (Code MU) on May 30 -- a day ahead of deadline. According with our agreement with them, they have until Friday to voice objections or ask for changes; otherwise, it goes into production for final printing.

Sima Lisman

Sima has been working on her program description document and user's guide for the Disturbance Simulation and Management Tool.

Dick Grumm

Dick has been on travel, going to quite a few meetings, including the Space Station Science Workshop, Lab Support Equipment telecons, a Mission Planning Workshop, etc. Some of them are quite interesting. At the Science Workshop, early payload developers are working out early engineering problems; they are finding that the "multi-bus interface" to the MDM (modulator/demodulator) is *not* standardized, causing development problems. The scientists are a "bit" disappointed and disturbed by this...

Some at McDonnell Douglas/Boeing (at MSFC) are working on short-term test plans -- minute-by-minute activity schedules (a week at a time) using data from the SUMIT data base. They are finding that SUMIT does not contain the appropriate detail to do this kind of planning. Dick is able to provide the necessary level of detail for this kind of planning.

Dick saw some evidence that MSFC folks are really starting to think about distributed ops. They have come a long way, but still have to develop the concept of how users will want to operate in a distributed ops environment.

ESA people are not happy with the idea of resource "envelopes"; they prefer more specific, time-ordered "profiles".

Funding for containerless processing (including Dick's MCPF) is uneven -- almost nothing in FY90-91, then ramping up sharply in '92. Dick is going to headquarters Wednesday to propose certain actions that will take advantage of the current crop of JPLers that have Space Station experience. He will coordinate this with Rob.

Kristan Lattu

The Lab Support Equipment activity has concluded. No more meetings or telecons are planned, but the group (and several sub-groups) are still available for further work as necessary. The task was "long and grueling, but worth it". A final report will be issued in a week or two. The bottom line: two groups of LSE has been set up. The first "core" group includes 26 items that the Space Station has agreed to develop; the second "non-core" group includes other items which Code S (formerly Code E) will be expected to provide as needed. Kristan will be issuing a memo on the details.

Kristan has received some training documentation that she will forward to the JPL Space Station library. It details the requirements being levied by Level II on users on what is needed to support the training process.

Upcoming Meetings

- June 3-6: Case For Mars III symposium in Boulder. Rob Staehle to attend.
- June 11-15: SSSAAS (Space Station Science Applications Advisory S...?) Summer Workshop at Woods Hole, MA. By invitation only. No one yet slated to attend.
- June 13: Evolution Working Group telecon to discuss Phase II Growth Implementation Plan, growth power requirements, Engineering Data Book status, PDR and CR status. Paul Henry will cover.
- June 20-22: First International Symposium on Measurement and Control in Robotics at JSC. No one yet slated to attend.
- July 17-19: Science Utilization Management Director's Review/MMDR at GSFC. Hershal Fitzhugh and Kristan Lattu to attend.
- September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos not corrected...)

AEROSPACE DAILY -- MAY 24 "RAND STUDY FINDS SHUTTLE-C TOO EXPENSIVE, NEED UNCERTAIN"

"A RAND Corp. study of U.S. space launch vehicle options over the next 20 years found NASA's unmanned heavy-lift Shuttle-C 'too expensive for routine transportation,' and questioned its need under any level of U.S. space activity except 'in the case of unique operational benefits' such as a near-term heavy-lift capability."

The Daily says the report was prepared with Air Force funding and recommends an independent evaluation of the Shuttle-C in the near future to determine if it should proceed to full-scale development.

The study, according to the Daily, sees no economic benefit nor any baseline traffic requirement for a Shuttle-C except for reducing the number of flights and assembly time for the space station and says NASA "has not been able to definitively balance the potential technical benefits of the Shuttle-C with the political costs of further increases to the space station's budget."

The Daily quotes from the reports author, RAND's Scott Pace, saying "decisions to develop a heavy-lift vehicle should be deferred for several years until their technical benefits become more compelling or until national needs (such as increased traffic demands) emerge for their adoption."

AEROSPACE DAILY -- MAY 25 "SMALLER U.S. MILITARY FORCE WILL BE MORE DEPENDENT ON SPACE"

"A smaller U.S. military force will be even more dependent on space capabilities than the present force, Adm. William Ramsey (USN-ret.), former chief of U.S. Space Command, said Wednesday."

The Daily says Ramsey's remarks were made at lunch at an American Astronautical Society meeting in Washington. Ramsey's remarks, according to the Daily, were focused on the capabilities a reduced U.S. military force would need and how a great many of them could be served by space-based systems.

The Daily cites Ramsey's recommendations as follows: Exploit sensor technologies developed through SDI and NASA programs; Make use of microminiaturization and materials technology advances to reduce weight and size of both space-based and ground-based systems; Integrate space systems into the ground segment; Shift operational control of existing launch complexes to Space Command; Develop less expensive satellites and launch systems; Improve distribution of space-acquired data to tactical commanders; Develop wide area surveillance systems; and Expand coverage of environmental and oceanographic satellites to maintain a 'weather edge.'

SPACE NEWS -- MAY 28 - JUNE 3 "CONGRESS SAYS OK TO MOON, MARS WORK" By Douglas Isbell

"NASA and Congress have settled their differences over how the U.S. space agency should spend money this year studying the lunar and Mars exploration program, clearing the way for the start of a broad program that will gather innovative exploration ideas"

The story says there will be no funding to begin exploration study contracts until 1991, though, as a result of a compromise between the Congress and NASA.

Space News says NASA may announce the exploration study, dubbed the outreach program, sometime this week.

SPACE NEWS -- MAY 28 - JUNE 3 "JAPANESE SEEK SPACE CADETS"

"The National Space Development Agency of Japan (NASDA) and the Science and Technology Agency decided May 16 to begin recruiting astronauts in 1991 for missions to the international space station."

Space News says the Japanese government intends to train about a dozen astronauts by the end of the century in a five year program to be conducted jointly with NASA and set to begin in the next three years.

SPACE BUSINESS NEWS -- MAY 28 "DOES 'NO' TO BOEING NIX STATION COMMERCE?"

"NASA had been expected to turn down Boeing's offer of commercial station logistics services for some time. But the reasons the proposal was rejected have left some industry and agency officials wondering whether any unsolicited commercial solutions to NASA's station needs can survive the agency's stress tests."

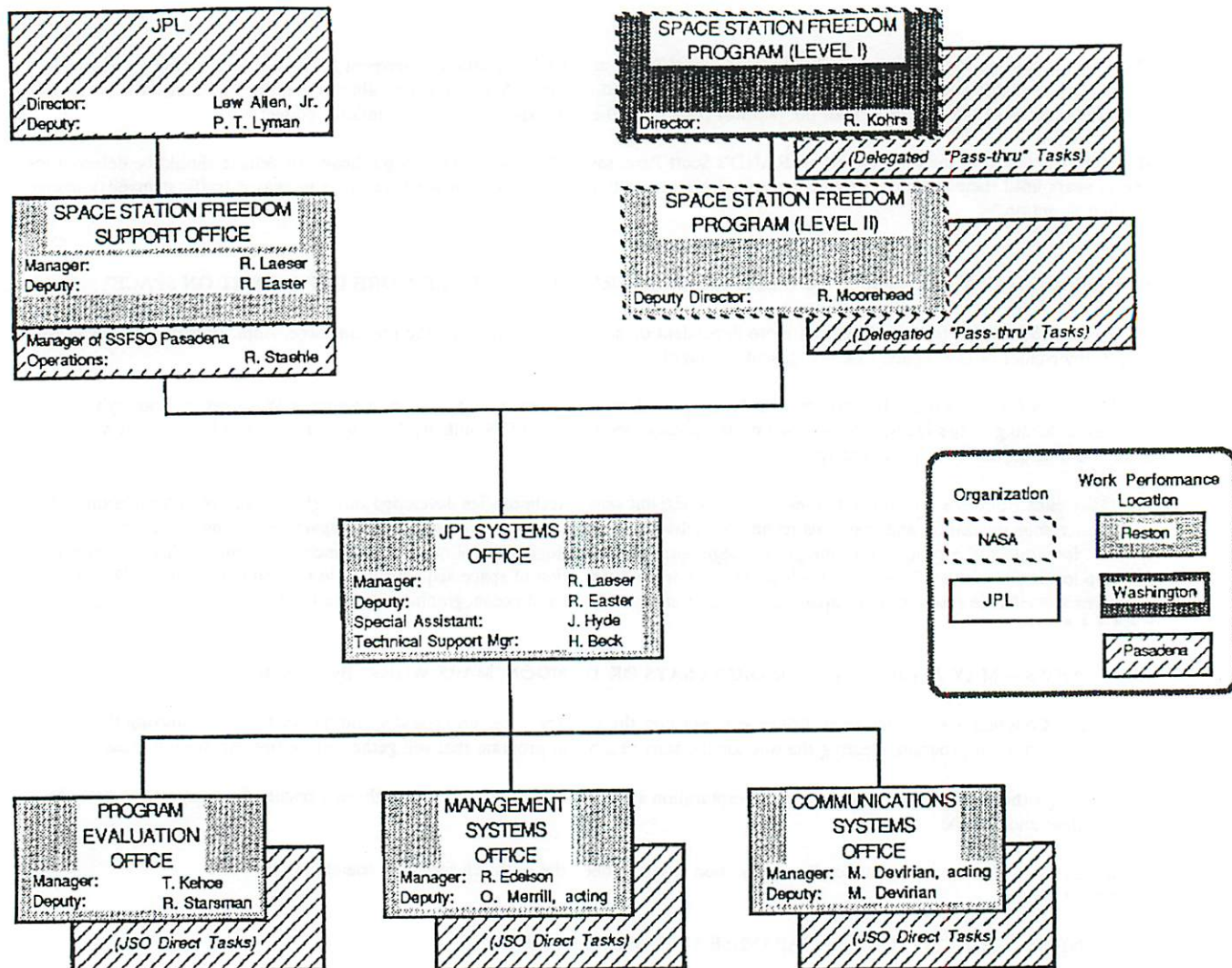
The SPACE BUSINESS NEWS story says the Boeing proposal was officially rejected in mid-May. In a letter from Associate Administrator for Space Flight William Lenoir to Gil Keyes, president of Boeing Commercial Space Development Co., it was said NASA decided not to accept the fall 1988 proposal because 'it...would result in higher long term costs to NASA...' and create other problems. In the communication to Boeing the NEWS said the rejection was not made lightly since NASA is committed to commercial participation in the Space Station Freedom program.

Lenoir discussed policy and regulation constraints that would result in added costs.

AEROSPACE DAILY -- JUNE 1 "SOVIET LAUNCH KRISTALL TECHNOLOGY MODULE"

"The Soviet Kristall technology module, carrying equipment to expand the Mir space station's capacity to grow crystals in microgravity and a ladder to be used in repair of thermal blankets that separated from the Soyuz return module, was launched yesterday from Tyuratam on a Proton booster."

The Daily quotes British officials saying the module should be docked with the station in about a week.



SSFSO/JSO Organization Chart

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Arnett, James	521	301-466	4-9282		JArnett
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brunstein, Sam	334	300-243	4-2561		
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	

	Sec	Mail Stop	Phone	NASAMail	TELEmail
Levin, Dick	311	601-237	4-1253		
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204			MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
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Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
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Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
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Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
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Wiener, Paul	310	301-230 ✓	4-5748		
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Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 102 (82 paper, 20 NASAMail) * Printed 4 June 1990

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-530

25 June 1990

TO: Distribution

FROM: Randy Cassingham

SUBJECT: SS Utilization Team Minutes for 25 June 1990

PRESENT: Paul Henry, Randy Cassingham, Dick Grumm, Hershal Fitzhugh, Kristan Lattu

Next Meeting: 18 June 1990 at 10:30 in 301-271

Note: The last two meetings were canceled due to travel. **Next week's meeting is canceled** due to travel also. The next meeting will be held in two weeks.

Paul Henry

On June 13, Paul participated in an Evolution Working Group "telethon" -- an all-hands telecon. There, Steve Cook/MT announced that the second increment of Transitional Definition funding for FY90 should be flowing any day. Among many other items discussed in the telecon, there was some discussion of Station crew growth resulting from rising maintenance demands as the station ages. Other principle items of discussion included:

- enhanced operations capability (formerly Phase II) assessment presented in chart form to Kohrs and apparently well received.
- the *Space Station Freedom Evolution Plan*, an executive summary-type document, is being written for approval as an applicable document to the PRD.
- growth CR status and comments.
- international participation in the growth process will include Engineering Data Book (EDB) review and comment by the Partners and the inclusion of the Partners' plans for growth in future EDBs.
- the Growth Power Plan will be presented to Kohrs on July 2.
- Paul thinks that the LaRC people did a great job on the Engineering Data Book -- Paul will put a copy in the Building 602 Space Station library.

Paul also met with Remer Prince/MU to gather background on Paul's new MU task to prepare a plan for Level I utilization.

While at HQ, Paul heard many comments regarding these weekly meeting minutes. Many people complimented us on the variety of opinions expressed and appreciated getting information that is hard to find from other sources. Others complained that it was difficult to tell whether some items were "fact" or were the opinion of the speaker. Since the purpose of the weekly meetings is open and frank exchange of information, it would be counterproductive to limit the discussion. Limiting the minutes to hard facts would result in a very brief dispatch. However, in the future, a greater effort will be made to indicate the background of a statement and whether it is based on opinion. Furthermore, it should be noted that anyone who disagrees with anything in these minutes may send signed corrections to Rob Staehle (via NASAmail to RStaehle or to mail stop 601-237) or to the person who prepared the minutes -- usually either Randy Cassingham (RCassingham/601-237) or Lori Paul (LPaul/601-237). They will be included in a subsequent report as corrections, clarifications, or counter-opinions.

Mike Drews/347 is now a detailee with Code MT.

Randy Cassingham

The publication of the *Introduction to Utilizing Space Station Freedom* document is stalled -- hopefully temporarily. It is expected that much of the information in this high-level description of the Station and its services and resources will change by the time the document hits the streets -- the same reason it has been held up for the last two years. Randy is delaying publication until he hears a positive go-ahead from both Dick Laeser/JSO and the sponsor, Remer Prince/MU.

Dick Grumm

A comment under Dick's name in the last meeting's minutes (4 June) mentioned that "Some at McDonnell Douglas/Boeing (at MSFC) are working on short-term test plans -- minute-by-minute activity schedules (a week at a time) using data from the SUMIT data base." Dick says he "probably said that", but it is not explicitly true -- they are apparently working with various data bases and a "dummy" of the SUMIT data base *structure*, but not the actual SUMIT data.

Dick was at headquarters last week to conclude the POP exercises concerning the Microgravity Containerless Processing Facility integration, operations and training. JPL has taken a stand that integration and operations should take place at JPL. We were asked, however, to provide an alternative budget for integration to take place at KSC and operations to take place at MSFC. These optional numbers were presented. Training was budgeted separately as it is not significantly affected by either option -- it is, however, affected by the fidelity and number of training sets (hardware and software simulation sets). Kristan Lattu/374 is coordinating the training aspect; Hershaf Fitzhugh/374 is working on integration; Wallace Tai/317 operations. One item of note regarding operations: so far, all operations studies have been done by MSFC personnel, and the studies all assume that operations will take place at MSFC. There is perhaps a need to make an alternative assessment of this scenario. JPL has asked for some money to look at this.

Dick will be on vacation until about July 5.

Hershaf Fitzhugh

The final draft of the new NMI (8010.1A) regarding Reliability Classification of NASA Payloads is now in-house, along with the OSSA equivalent. Bob White and Valerie Thomas are reviewing them. The 8010.1A document looks pretty good so far; the OSSA document needs some more review.

Fitz spent last week doing EXOICE costing. The funding for this accepted program has been cut by more than two thirds. Over the next 2-3 months, Fitz will be using this funding level as a driver to see what level of science it can support.

This morning, Fitz got a call from Parker/JSC (Fitz didn't catch his first name) to notify him of a "data base telecon" that will take place mid-week. Fitz isn't sure what exactly it is about. He will attempt to get details and forward the information to Dick Grumm or others who might be interested in it.

Fitz will be on vacation for two weeks starting this Friday.

Kristan Lattu

Kristan has issued a memo summarizing the results of the Laboratory Support Equipment (LSE) working group. For a copy, contact Kristan.

The SUM Director's Review has been paired with the SUM Annual Project Review (instead of the MMDR) and has been pushed to August.

Upcoming Meetings

Late July (tbd): EWG Videocon

July 30-31: UDAWG for U.S. Laboratory Module at MSFC. Hershal Fitzhugh to attend.

August 27-28: SUM Annual Project Review at HQ. Hershal Fitzhugh and Bob White to attend.

August 29: SUM Director's Review at HQ. Hershal Fitzhugh and Bob White to attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related Items from Code P's "Daily News in Brief" (Typos not corrected...)

ASSOCIATED PRESS -- June 5

"GRAVITY CHAMBER" By Michael Graczyk

"Help Wanted. Baylor College of Medicine seeks 16 good sleepers to spend a month lying down. Salary uncertain, but benefits include breakfast in bed -- lunch and dinner, too."

AP says the people they select won't be allowed to get up for the the entire month, and they'll spend part of their time spinning around in a space-age sleep chamber that looks like something straight out of a science fiction movie.

The story says the subjects will be hooked up to sensors that monitor a dozen bodily functions as part of a test sponsored by a NASA \$650,000 grant to see if the physical strain can be eased on astronauts making lengthy space voyages.

The AP says the research is designed to counteract some of the physiological effects of weightlessness during space travel particularly pertinent in light of the space station and plans to send astronauts to Mars.

The story describes the bed-rest experiment and says the platform, containing the beds will turn, spinning the subjects about 20 times a minute to simulate one-G -- or about the force of Earth gravity.

AP says the Baylor scientists believe a regular schedule of exposure to one-G or more will have the same effect as frequent exercise and that if successful, such a device might be used on ythe space station or on a trip to Mars.

LOS ANGELES TIMES -- June 4

"SOVIETS FORGE AHEAD WITH MANNED SPACE PROGRAM, U.S. DELEGATION REPORTS" By Lee Dye

"U.S. scientists who recently toured key space facilities in the Soviet Union have concluded that, despite widespread problems throughout that troubled country, the Soviet space program is alive and well and will feature a major space feat as early as next year."

The LA Times reports they were told the Soviets will dock their shuttle with their space station as early as next year despite speculation in the West of atrophy within the Soviet program. The LA Times quotes sources as speculating the Soviets will dock the Buran shuttle with Mir during an unmanned ascent but that the Buran will return to Earth with cosmonauts from Mir.

The Times story says members of the U.S. delegation, which included Planetary Society members, recently toured the Soviet launch complex and witnessed two Engergia launchers in advanced stages of construction. The Times adds the delegation also saw a third Soviet shuttle under construction.

The Washington Post -- JUNE 7

"DECIDING WHO TAKES OUT SPACE TRASH" By Jack Anderson and Dale Van Atta

"A few summitry subjects never get raised in superpower chats in the Oval Office, such as the issue of man-made garbage floating in space. Yet, as the Cold War thaws, it is more likely that an American will be killed by Soviet space trash than by a nuclear weapon."

The Post piece says 6,700 large pieces of refuse, old satellites and billions of pieces of small junk, including paint flecks orbit the Earth. The articles says if the space junk doesn't kill someone when falling to Earth, it poses a significant threat to astronauts citing the fact that a paint fleck traveling 17,500 miles per hour can be fatal to a space-walker.

The column says that what's most intriguing about quiet junk reduction talks now occurring is that neither the White House nor the State Department took the initiative. The story says NASA is handling the agreement in hopes of keeping politics out of it.

The report concludes stating NASA negotiators may even address the sensitive subject of the Soviet's throwaway mentality adding that cosmonauts have a habit of tossing trash bags out of the Mir space station."

UNITED PRESS INTERNATIONAL -- June 7
"NASA CANCELS 'SPACE TUG' PROGRAM"

"Citing a tight budget and no immediate need, NASA announced plans Thursday to cancel development of a remote controlled 'space tug.'"

UPI quotes NASA space flight chief Bill Lenoir saying "it, or something similar, eventually will be needed in our space infrastructure. But we will have at least two or three years to develop firm requirements before it will be necessary to begin development."

The story says the only existing requirements for the vehicle were to have been a reboost of the Hubble telescope and the Advanced X-ray facility but these tasks can be done by a shuttle as well. The story says the cancelled program was conceived as a low-Earth orbit free-flying space tug capable of performing on-orbit servicing and retrieval missions.

WASHINGTON POST -- June 11
"A DESIGN FOR MAKING SERVICE CALLS IN ORBIT" By Kathy Sawyer

"Low earth orbit is no farther from the ground than Philadelphia is from Washington. But in the first 30 years of the space age, human access to that 'high frontier' has been a complicated, costly, high-tech affair -- the province of big government and big industry."

The Post article discusses an idea put forth by a former Rockwell engineer, most recently employed by DARPA, to use off-the-shelf technology for a single-person-to-earth-orbit-and-return space vehicle. The vehicle, according to the Post, would hold a single space-suited individual who could service satellites in low earth orbit.

The article quotes from former NASA space flight and SDI chief Lt. Gen. James Abrahamson who describes the idea as "visionary, in the sense that it's way ahead of many people's thinking." The article also quotes from former NASA official Phillip Culbertson who says the idea is "extremely intriguing" and "looked at very little by the government."

The Post says the inventor, an independent Rosslyn, Virginia, engineer -- Fred W. "Bud" Redding, Jr. -- worked on the idea while most recently employed at DARPA and quotes former DARPA project manager James Allburn as saying "there were questions, but it sounded feasible. It certainly would be a large step forward in capability if it were to be developed."

The Post describes how such a vehicle would work: it would be launched atop an expendable into low earth orbit, would use onboard hydrazine thrusters for orbit changes and maneuvering, would have a nose-mounted platform for crew-effected repairs, and would reenter much like a missile and use a parafoil for soft landing.

The Post reports the major stumbling block to this idea is its requirement for a dependable expendable launcher of moderate cost and notes that such a launcher is still lacking in the U.S. space vehicle fleet.

SPACE NEWS -- June 11-17
"SOVIETS PLAN SPACE RESCUE TEST; BURAN MISSION AWAITS KRISTALL" By Lon Rains

"The Soviets last week disclosed an ambitious plan to demonstrate a cosmonaut rescue in 1991 using their Buran space shuttle.

However, the mission plan was jeopardized almost immediately by the failure June 6 of a docking attempt between the Mir space station and its new computer-piloted expansion module."

Space News says the Buran mission cannot take place until the Kristall is securely docked with Mir, but that notwithstanding, the rescue demonstration would consist of two separate docking maneuvers.

The weekly says the first of these maneuvers would involve docking Buran with Mir and the second would come after both the Buran and an already docked Soyuz had left the station. In this second maneuver, Space News says the goal would be to dock the Soyuz with the Buran after which the Soyuz would return the crew to Mir and the crewless Buran would return to earth.

AVIATION WEEK -- June 11-17
"ZEROING MOON/MARS"

"The Space Exploration Initiative, the Administration's plan for a permanent lunar base and then a Mars landing by 2019, seems headed for a tough time in Congress. Key members of the House and Senate Appropriations subcommittees for NASA are said to be prepared to try to hold next year's funding to zero."

The magazine says the central question in this dialogue will be how much of NASA's space research and technology request is labeled Moon/Mars-related.

AEROSPACE DAILY -- June 12
"KRISTALL MODULE DOCKS WITH MIR"

"The Soviet Union's Kristall technology module docked with the Mir space station on Sunday, observers said yesterday."

The Daily says the module was docked along Mir's longitudinal axis and that shortly it will be repositioned to be in line with the Kvant module. The Daily conjectures that a currently docked Soyuz, now at the back of the Kvant, will presumably be moved to the front port of Mir after the repositioning of the Kristall module.

AEROSPACE DAILY -- June 12
"NASA AWARDS CONTRACTS FOR SATELLITE SERVICER SYSTEM"

"Design concepts for a satellite servicer system that would refuel and repair satellites beyond the range of the Space Shuttle will be studied by Martin Marietta Corp. and TRW Inc. under competitive 12 month \$1.3 million contracts with NASA."

The Daily reports that the system would consist of a support module with docking hardware and a telerobotic system which would be remotely controlled from ground stations and/or the shuttle.

AEROSPACE DAILY -- June 15
"SPACE STATION, MOON/MARS INITIATIVE CUT BY HOUSE PANEL..."

"A House Appropriations subcommittee has made substantial cuts in the Space Station and the moon and Mars initiative in approving \$14.3 billion in fiscal 1991 NASA appropriations which is more than \$800 million below the Administration's request, subcommittee sources said yesterday. The Administration requested \$15.1 billion for the space agency."

The Daily says the Space Station request for \$2.6 billion was trimmed by \$195 million and the request for exploration technology was cut by nearly \$150 million. The Daily says additional cuts were also made to the Earth Observing System (\$15 million) and the National Aerospace Plane (\$5 million).

AEROSPACE DAILY -- June 26
"PROPOSED SPACE STATION CUTS WOULD RAISE LIFE CYCLE COSTS"

"There is not enough fat in the Space Station program to absorb almost \$200 million in fiscal year 1991 funding cuts made by a House Appropriations subcommittee without raising life cycle costs by several times that amount, according to William B. Lenoir, NASA associated administrator for space flight."

The Daily says Lenoir made his comments during a press briefing last week and quotes him saying "the first thing we would be forced to do is to take another look at the system and see what's in there that I don't absolutely need to support my first stage assembly."

Cuts could be absorbed by delaying the development of some elements at a cost of up to three times the amount deferred, according to the Daily's citations from Lenoir's briefing.

The Daily quotes Lenoir saying the proposed cut would force NASA to assume it won't need any reserve funds to cover problems which develop after the preliminary design review and "that is sticking our head in the sand, and I am not comfortable with that."

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Arnett, James	521	301-466	4-9282		JArnett
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brunstein, Sam	334	300-243	4-2561		
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
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Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
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Levin, Dick	311	601-237	4-1253		
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA	95204		MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
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Total: 102 (82 paper, 20 NASAmall) * Printed 26 June 1990

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-546

9 July 1990

TO: Distribution

FROM: Lori Paul 

SUBJECT: SS Utilization Team Minutes for 9 July 1990

PRESENT: Paul Henry, Randy Cassingham, Dick Grumm, Hershal Fitzhugh, Kristan Lattu

Next Meeting: 16 July 1990 at 10:30 in 301-271

Note: Last week's meeting was canceled due to travel.

Rob Staehle

Rob attended the Committee on Space Research (COSPAR) meeting in The Hague, Netherlands. Much international enthusiasm was expressed for a manned mission to Mars; in fact, in some ways the international interest in a Mars mission seems to be greater than the support for such a project here in the United States.

The following documents are now available from the JPL Space Station Library:

- Telescience Testbed Pilot Program Final Report by the Research Institute for Advanced Computer Science (RIACS)/Ames Research Center.
- Beyond the Baseline, proceedings from the Space Station Evolution Symposium (this is a large, multi-volume document).

Contact L. Paul at 4-1166, (mail stop 601-237) to arrange a loan of these documents.

Randy Cassingham

Publication of the Introduction to Utilizing Space Station Freedom (the "investigator's guide") is still stalled. Comments from Code MU are over a month late. They have promised delivery of the comments in the very near future.

Paul Henry

A list of functions and products has been compiled for the Level I utilization plan. Paul has begun writing the Partner Utilization Plan (PUP) portion of the plan. A draft of the plan is due in mid-August, however, currently scheduled absences of key Level I staff might affect the timely review of the plan. In approximately two weeks Paul will visit Remer Prince/MU to discuss the status of the task.

The following CRs have been received from JSO:

- 3 CRs concerning Utility Ports (Paul will respond to all three)
- 1 CR on Microgravity Environments (Sima Lisman will review this CR or recommend a reviewer)
- 1 CR on Electrical Power Systems Grounding (forwarded to Stanley Krauthamer)
- 1 CR on Navigation Base to Inertial Attitude Knowledge (Sima Lisman will identify a reviewer in Division 34)

Comments on the CRs are due to Bob Glass/JSO before 25 July.

Paul will provide support for a paper Jayant Sharma/312 will be presenting at the upcoming AIAA Astrodynamics conference series in Portland, Oregon (20-22 August). The paper will address work done for Code MT regarding planetary mission departures from the Space Station.

The Evolution Working Group will meet at JSC in mid-August with JSC's distributed systems study managers to discuss the status of system growth and the PDR.

Dick Grumm

Dick is working on the funding profile for his FY91 and FY92 tasks. He is concerned that limited FY91 funding may cause a critical loss of current staff and valuable expertise which will be needed during Space Station efforts in the better funded FY92. Experienced JPL staff would be very useful in the rapid staffing-up of FY92 development initiation for Space Station microgravity facilities and experiments.

On 11 July, Dick will meet with Mark Foster at McDonnell Douglas in Huntington Beach to have a "mutually beneficial informal dialogue" concerning user integration issues.

Dick will be participating in a video conference this afternoon (9 July) with Langley Research Center regarding Langley's proposed Spacelab to Space Station transition study.

Sima Lisman

Sima's paper, "Space Station Freedom Disturbance, Simulation, and Management Tool (DSMT)," has been accepted for the Guidance, Navigation, and Control conference (one of the four conferences comprising the upcoming AIAA Astrodynamics conference series) to be held in Portland, Oregon from 20-22 August.

Gerry Murphy is organizing the Space Station Freedom Environment and Effects Modelling Workshop, scheduled for 24-27 July at the Pasadena Convention Center. Workshop attendees will be divided into four working groups which will study specific environmental issues and requirements for 2-1/2 days. The groups will reconvene on the final day of the workshop to report on their discussions and conclusions. Sima will attend.

Sima will leave work on the Space Station this September to join CRAF (Comet Rendezvous and Flyby)/CASSINI. Her replacement on Space Station will be announced later this summer.

Lori Paul

Lori worked extensively on the production of the FROST Version 1.0 User's Guide to meet the 27 June deadline. The guide was delivered to Alan Webb/Reston on time and used in the FROST presentation and subsequent demonstration held in Reston on June 28. Secondary distribution of the document is in progress. Thus far, comments on the User's Guide have been quite favorable. Contact Lori at 4-1166 (mail stop 601-237) to obtain a copy of the guide.

Upcoming Meetings

July 24-27: Space Station Environment Workshop at the Pasadena Convention Center. Sima Lisman to attend.

July 30-31: UDAWG for U.S. Laboratory Module at MSFC. Hershal Fitzhugh to attend.

August 27-28: SUM Annual Project Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.

August 29: SUM Director's Review at HQ. Hershal Fitzhugh and Bob White to attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos not corrected...)

The Wall Street Journal -- July 9

"AFTER RECENT SETBACKS NASA FACES A FIGHT OVER PROJECT FUNDING" By Bob Davis

"The National Aeronautics and Space Administration, already badly wounded by troubles with the Hubble Space Telescope and the space shuttle, is facing two more potentially crippling blows."

Referring to NASA's proposed \$37 billion space station, the Journal quotes Rep. Bill Green (R-NY) saying "this is the last point at which we can pull the plug." The Journal says with the station being overweight, underpowered, with no proof it can perform, and requiring extra space flights for assembly, Congress is threatening to cut off funds in December.

Additionally, the Journal cites Space Council questions on NASA's next big science project, the \$50 billion EOS, quoting from a spokeswoman who says, "the question is, do we have a design that has an acceptable level of risk and [provides] a maximum return as quickly as possible?" The White House is reconsidering support, according to the article.

The Davis piece says that these problems, the grounding of the shuttle fleet, and Hubble's woes promise a painful re-examination of the nation's space program with three sets of congressional hearings to get underway and two investigations of space station.

The Journal suggests that also falling victim to criticism -- directed at NASA -- may be the Mars mission and that the argument against big science also will be stoked.

The Journal piece continues, casting doubts on whether the post-Challenger NASA is any different than its predecessor -- citing management difficulties with Hubble, space station weight, power, maintenance difficulties and shuttle technical problems. The Journal notes uncertainties of the EOS program and White House re-evaluation of support and says Hubble's mirror problem "brought home the riskiness in EOS to the White House.

The business paper says that while several studies are being prepared, one, by Robert Jastrow's Marshall Institute, is expected to challenge EOS's underlying premise -- that big, complex, satellites are necessary to answer pressing climate questions. The Journal cites the ex-NASA scientist's argument, saying EOS is wrongheaded and far too expensive because it doesn't zero in on the most important climate questions, such as whether clouds are increasing or decreasing.

The concluding paragraphs of the lengthy story say that NASA defended its big satellite approaches as providing the best way to get a complete look at changes in the environment, and, that according to NASA's head of space science, Lennard Fisk, problems with the Hubble don't foretell problems with EOS.

The Journal concludes that the current problems suggest a pattern, that all these projects have their antecedents before Challenger when budgets were flat and the agency was struggling to find a mission and quotes George Washington University/Space Policy Institute's John Logsdon saying "NASA had to do everything at a higher level of risk than...It's come back to bite us."

UNITED PRESS INTERNATIONAL -- July 10

"SPACE STATION MAY NEED TOO MUCH MAINTENANCE, STUDY SAYS" By Rob Stein

"In yet another blow to the nation's beleaguered space agency, a study has found the proposed space station may require too many risky spacewalks for routine maintenance, a published report says."

UPI cites a Space News article which says the proposed Freedom space station would require six spacewalks each week for routine repairs -- raising questions about the station's practicality.

The wire says the estimate of space walks is from a draft copy of a report prepared for NASA by astronaut William Fisher and Johnson Space Center robotics expert Charles Price -- neither of whom it could reach for comment.

UPI reviews previous reports from the team of Fisher and Price, who, the wire says, reported in March that the station would require 2,284 hours of spacewalks a year for maintenance tasks.

UPI says the previous report translated into more than three spacewalks per week to replace batteries, valves and pumps and would seem to be an inordinate amount of maintenance time.

The wire report states that NASA asked the Fisher-Price team to continue their analysis because NASA expected the final report would produce estimates much lower than the March preliminary numbers.

The wire story concludes by stating that NASA is looking at alternatives to the number of spacewalk hours including more efficient spacewalk procedures and the use of robots to replace and/or augment humans for some of the tasks.

ASSOCIATED PRESS -- July 11
"SPACE STATION"

"A new NASA report concludes that the planned \$37 billion space station will require nearly 75 percent more maintenance than earlier predicted, a newspaper reported today."

AP picks up from the New York Times the story that a NASA review panel has concluded that maintenance activities anticipated for the space station will require more space walks than seem reasonable and that NASA is now trying to find alternatives to the maintenance issue.

AP paraphrases the Times in that paper's assessment that NASA is very politically sensitive on this issue and is trying to downplay the importance of the study and the implications of the problem.

The report does conclude on a somewhat optimistic note citing several potential ameliorating aspects of robotics and possible redesign of space station items to make maintenance easier.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAMail	TELEmail
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brunstein, Sam	334	300-243	4-2561		
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
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Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/SU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/EN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		

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Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Maseline, Richard	366	301-440	4-4889	RMaseline	
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Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204			MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
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Nishioka, Ken	381	168-227 ✓	4-7674		
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Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
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Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
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Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
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Wada, Ben	354	157-507	4-3600		
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White, Robert H.	784	233-200	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 101 (79 paper, 22 NASAmail) * Printed 11 July 1990

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-559

23 July 1990

TO: Distribution

FROM: Lori Paul

SUBJECT: SS Utilization Team Minutes for 23 July 1990

PRESENT: Rob Staehle, Bob Easter, Randy Cassingham, Dick Grumm, Chuck Ivie, Sima Lisman, Gerry Murphy, Lori L. Paul

Next Meeting: 30 July 1990 at 10:30 In 301-271

Note: Last week's meeting was canceled due to travel.

Bob Easter

Bob Easter attended the meeting briefly to review the agenda (and his own presentation) for the Director's Review and Discussion (DRD) meeting, which will take place today (23 July 1990).

The House has passed a \$2.5 billion budget for the Space Station Freedom Program budget. A limit of \$750 million was set that requires the completion of the PDR and satisfaction of four design conditions before release of the balance. The conditions included provisions regarding user power and the assembly sequence. The Senate will vote soon on its version of the budget.

A General Accounting Office (GAO) audit of the entire Space Station Freedom Program was announced and discussed. (See more about this under Rob Staehle.)

Subsystem and work package PDRs are in progress. Thousands of RIDS have been submitted for several PDRs. There are those who feel there is a serious need for a comprehensive Space Station ground testing facility (a "hangar queen" version of the Station constructed exclusively for ground testing).

A recently established JSO "turbo team" is conducting a resource scrub of Space Station system designs. As current designs stand, over-redundant systems would result in too much weight and power consumption on the Station. Insufficient weight and power allotments would be left over for users. The team will review resource needs and identify inconsistencies and redundancies between various systems. Improved approaches to resource planning will be suggested.

Work is proceeding on applying the JPL-developed Resource Allocation Planning Helper (RALPH) to assembly sequence planning. Chet Borden/311 is leading Pasadena work, with Mark Bergam/JSO serving as the interface with Bill Bastedo/MSE. RALPH may offer solutions to some particularly difficult problems, such as optimizing launch vehicle manifests and examining the impact of failures.

Mike Devirian/JSO will discuss the C&T audit and resource scrub topics at the DRD today. Dick Laeser, on behalf of Tom Kehoe/JSO, will discuss the involvement of JSO in life support assessment.

Rob Staehle

The GAO has initiated an audit of the Space Station Program. Two auditors have been assigned to Southern California and are based at JPL. Rob has issued a memo regarding the scope of the audit and proper protocol for staff meeting with the auditors. All staff members are asked be

honest and cooperative. If contacted by the auditors, please try to schedule a meeting with them, rather than talk with them on the spot. Then, report the meeting arrangements to Rob and Marthella Greene in the JPL Contracts Management Office (x4-2425). Marthella will provide guidelines for discussion with the auditors.

JSO has published new resource guidelines for the FY90 fourth quarter SRMs. Budgets for July, August, and September must be zero-based; in other words, total expenditures are not to exceed the specific allotted amounts of funding for each account. Funds left over in prior accounts may not be retained.

Division approved SRMs for JSO Communications System Office (Mike Devirian)-sponsored tasks are due to Rob at the close of business on 27 July. Other SRMs are due next week. If any changes in Work Package Agreements (WPAs) are needed, hand write the alteration(s) on a copy of the most recent WPA. Do not re-write the entire WPA.

Rob advised managers to plan carefully for ongoing tasks which will require FY91 funding. FY91 funds will not be available for the first 6-8 weeks of the coming fiscal year. For this reason, task managers should reserve at least six weeks of carryover funds from their current FY90 budgets to cover the projected gap. Carryover plans, and the impacts of those plans on staff and tasks, should be submitted to Randy for his collation by close of business on 26 July. Rob will discuss impacts with JSO.

Paul is meeting tomorrow (24 July) with Remer Prince/MUU to deliver the first draft of his Level I utilization plan. Rob has reviewed the draft and provided comments. Remer has repeatedly expressed interest in our suggestions regarding how Level I should handle users and user issues, though our views are not always accepted.

Rob has approved Hank Garrett's abstract, "Space Environment Effects on Space Station Operations," for the AIAA annual meeting in January.

The AIAA/NASA Second International Symposium on Space Information Systems will take place at the Pasadena Hilton 17-19 September 1990. Several JPL speakers are on the agenda. Several presentations will be of interest to Space Station staff. (See the preliminary symposium agenda attached to the minutes.)

The AIAA/NASA Conference on Innovative Technologies for the Exploration of Space will take place at the Ramada Renaissance Techworld in Washington, D.C. on 5-6 September 1990.

ESA has requested JPL Vibroacoustic Payload Environment Prediction System (VAPEPS) software for their Space Station work. Dennis Kern/521 and Gordon Chapman/NASA-Pasadena are seeking approval for the request through proper channels.

The document "Space Station Freedom Pressure Reduction Study", by Kim A. Aaron and R. Frank Tillman, is now available from the JPL Space Station Library. Contact L. Paul at x4-1166, 601-237, to arrange a loan of this document.

Rob pointed out that an editorial in Sunday's *Los Angeles Times* Opinion section by Gregg Easterbrook incorrectly cited J. R. Thompson (currently NASA Administrator) as director of MSFC when Challenger was lost. In fact, Thompson replaced William Lucas after the Challenger accident when Lucas was given early retirement. The editorial also stated that the X-15 research aircraft program was accident-free, which it was not.

Randy Cassingham

Code MU's comments for "Introduction to Utilizing Space Station Freedom" have finally been received. Their comments were delayed by more than a month because of a concern over the inclusion of polar platform information in the publication. Since Code S now manages the platforms, it was suggested that they should not be described in a Space Station Freedom Program document.

However, because the platforms are described in Partner MOUs, Kohrs decided it was appropriate that they be included in the guide. Randy will begin his updates based on the comments this week.

Randy reviewed the draft of the "The Space Station Freedom User's Guide" (see Chuck Ivie for more on this). Like Chuck, Randy found that the guide was lacking in detail and greatly overlapped the "Introduction to Utilizing Space Station Freedom". He feels that this sets a bad precedent for redundant user documentation which, with the complexity of the Station, could quickly become a user nightmare.

Gerry Murphy

Gerry's Space Station Freedom Environment and Effects Modelling Workshop is in progress at the Pasadena Convention Center (24-27 July). Attendees include Level I and II staff, representatives from other NASA centers, and various contractors. William Taylor/M, the new program scientist, has been pleased with the environment work thus far. Last week he expressed his appreciation to Rob for Gerry's coordination of this difficult, multi-center activity.

Gerry described possibilities under discussion for dramatically reducing the number of sensors required to measure environment parameters at the Station. He felt that a MSFC cost estimate reported for the Neutral and Plasma Interaction Monitoring System (NEUPIMS) of \$130M dollars was overly high.

Sima Lisman

Final drafts of the DMST program description document and user's guide are under review. Sima is waiting for comments. Preliminary versions are currently in use.

Dick Grumm

Last week Dick attended a data archive meeting sponsored by the Microgravity Science staff at GSFC. The two day informal seminar described various planetary data systems, ocean data systems, and land data systems. The meeting conveyed the basic message that critical research data must be better preserved, though data system applications and storage methods are so diverse. Larry Preheim/366, who is interested in microgravity data and archive requirements, could not attend the seminar.

Lori Paul

Final distribution of the FROST Version 1.0 User's Guide is in progress. Contact Lori at 4-1166 (601-237) to obtain a copy of the guide.

Repeated attempts to connect JPL with the TMIS system have failed. Jim Jacobson/372, who is managing the connectivity effort at JPL, is not optimistic that JPL will have access to the TMIS network anytime in the near future. Boeing TMIS has requested that Hank Beck/JSO sign off on the CR regarding JPL connectivity. Lori and Jim Jacobson have strongly opposed this. According to Jim, Boeing's claims that they have satisfied the requirements of the CR are false. TMIS engineering support has been lacking and they have been unresponsive to some serious and global technical problems that exist in their system. On this recommendation, Hank has withheld his signature.

Chuck Ivie

Last week Chuck reviewed "The Space Station Freedom User's Guide" (2 July 1990, 3rd Draft) produced for Code MU by TADCorps. His comments were sent to Bob Vuolo/JSO. Chuck felt that the guide was fairly well written and raised several important issues; however, it lacked the level of depth and detail that a user would require to make effective use of the Space Station. There is also some concern that "The Space Station Freedom User's Guide" overlaps too much of the "Introduction to Utilizing Space Station Freedom" document (prepared by Randy) in its scope and content.

Upcoming Meetings

July 30-31: UDAWG for U.S. Laboratory Module at MSFC. Hershal Fitzhugh to attend.
August 2: Telecon to discuss the OSSA Training Concept paper and the training management plan. Dick Grumm (and perhaps others) will participate.
August 27-28: SUM Annual Project Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.
August 29: SUM Director's Review at HQ. Hershal Fitzhugh and Bob White to attend.
September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. No one yet slated to attend. **The agenda is attached.**

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos not corrected...)

UNITED PRESS INTERNATIONAL -- July 20

"COSMONAUTS MAY NEED SECOND SPACEWALK NEXT WEEK" By Gerald Nadler

"Two Soviet cosmonauts who made a harrowing seven hour spacewalk to fix the spaceship that is to take them home may have to venture from the Mir station again next week to close a balky hatch, mission control said."

UPI quotes Moscow Mir Mission Control chief Viktor Blagov as saying "they might have to go out into outer space next week, perhaps July 26 or July 27. We are studying the situation. The majority of our specialists think they will have to go out." UPI says the cosmonauts were outside the space station Tuesday evening on a repair task to fix insulation which had become detached from the Soyuz ferry ship and upon reentering the station found they could not close the hatch -- located on the Kvant-2 astrophysics module.

UPI again quotes Blagov saying "there is no danger whatsoever to the cosmonauts, the spaceship or the Mir station...The station has three sections. They are hermetically sealed and isolated from each other like in a submarine. The very outside section has the hatch that is not closed."

The wire service states the Soviet government had hoped the current crew's six month mission aboard Mir would earn about \$40 million in hard currency from the United States and other nations sponsoring applied research from the space station.

The wire further states that recurrent problems aboard the station have prompted newly emboldened Soviet lawmakers and journalists to question the Soviet's \$17.1 billion space program and its future direction.

ASSOCIATED PRESS -- July 21

"SPACE STATION" By Paul Recer

"Up to 10 spacewalks a week will be needed to maintain outside components of the proposed Space Station Freedom unless there are major design changes, a study says."

AP's Washington science writer reports that the study which was released Friday and authored by astronaut Bill Fisher and Johnson Space Center engineer Charles Price, shows that in peak maintenance years with the present space station design, two astronauts working together would have to spend up to 6,462 hours a year in space suits repairing and replacing parts.

AP cites Fisher, responding to his study, stating that simplifying repair tasks and making all parts replaceable by robots could drop the total annual space walk hours to 507. The wire says Richard Kohrs, director of the space station program, said that design of the station is now undergoing a major review and that each of the recommendations in the Fisher-Price study will be evaluated, "we're going to build the space station for science research, if you are spending a major part of your time on space walks, then you are taking that away from science."

SPACE NEWS -- July 23-29

"OFFICIALS: STATION PRICE COULD GO UP AS WEIGHT COMES DOWN" By Douglas Isbell

"The weight problem recently disclosed by NASA on its proposed international space station can be solved in a variety of ways, including changing some of the materials used in its construction. However, the changes are likely to add to the facility's cost, according to some officials."

Space News reports that the U.S. portion of the station is currently about 20 percent overweight with design goal weight at 512,000 pounds and current estimated weight at 625,000 pounds. Space News quotes a former NASA official as saying "the good news is that Reston is finally being allowed to take charge of this one issue" and quotes program director Dick Kohrs saying "we'll have to make some tougher decisions."

The newsweekly doesn't identify a dollar figure for the increased cost, though.

AM

7:00

7:00

Registration Badge Pick-up

8:30

Introduction of Symposium

Objectives and Themes

Program Cochairmen

John T. Dalton

Chief, Data Systems Technology

Division

NASA Goddard Space Flight

Center

Robert C. Tausworthe

Chief Technologist, Information

Systems Division

Jet Propulsion Laboratory

8:45

Welcome

Lew Allen

Director

Jet Propulsion Laboratory

9:00

Opening Remarks

Symposium General Cochairmen

Lennard A. Fisk

Associate Administrator

for Space Science and

Applications

NASA Headquarters

Charles T. Force

Associate Administrator for

Space Operations

NASA Headquarters

9:30

Keynote Address

Richard H. Truly

Administrator

National Aeronautics and Space

Administration

10:00

Break

SESSION I -

OVERVIEW OF MAJOR

SPACE INFORMATION

SYSTEM PROJECTS

Cochairmen

John T. Dalton

Chief, Data Systems Technology

Division

NASA Goddard Space

Flight Center

Robert C. Tausworthe

Chief Technologist, Information

Systems Division

Jet Propulsion Laboratory

10:15

Introduction

10:20

Space Information Systems:

The European Space Agency

Activities and Plans

Claude L. Honvault

Head of Systems and Project

Support Department

K. Lenhart

European Space Agency/ESOC

10:50

Trials for Developing

Information Systems in NASDA

Space Information System for

JEM Era

Shigeru Igarashi

Director, Tracking and Data

Acquisition Department

S. Yamada

National Space Development

Agency of Japan

11:20

Overview of NASA Space

Information Systems Projects

Cochairman

John T. Dalton

PM

12:00

Luncheon Program

Remarks by

General Jean-Loup Chretien

Centre National d'Etudes

Spatiales

ATTACHMENT 1

AGENDA FOR THE AIAA/
NASA 2ND INTL SYMPOSIUM
ON SPACE INFO SYSTEMS @
PASADENA HILTON
17-19 SEPT 1990



MONDAY / 17 September 1990

PM
2:00

SESSION II A -
SCIENCE INFORMATION
SYSTEM REQUIREMENTS
FOR THE '90s

Chairman

Ray J. Arnold
Director, Communications and
Information Systems Division
NASA Headquarters

Organizer

Joseph H. Bredekamp
Chief, Information Systems
Branch
NASA Headquarters

2:00

Introduction

2:05

Prospects for Scientific Data
Analysis Systems for Solar -
Terrestrial Physics in the 1990s

J. Scott Poucher
Distinguished Member of
Technical Staff
L. Lanzerotti
AT&T Bell Laboratories

2:25

Astrophysics Data System:
Near Term Plans and Visions
John C. Good
Astrophysics Data Systems
Project Manager
IPAC/CALTECH/JPL

*Additional Papers will be listed
in Final Program.*

PM
2:00

SESSION II B -
INFORMATION SYSTEMS
DESIGN APPROACH FOR
MAJOR PROGRAMS

Chairman

Claude L. Honvault
Head of Systems and Project
Support Department
European Space Agency/ESOC

Organizer

James P. Bigham, Jr.
Program Manager
CTA, Inc.

2:00

Introduction

2:05

The EOS Data and Information
System (EOSDIS)

H. K. Ramapriyan
Deputy Project Manager
EOS Ground Systems and
Operations
NASA Goddard Space Flight
Center

2:30

The Space Station End-to-End
Data System: Linking
Architecture and Operations
Stanley Fishkind

Technical Advisor to the
Director
Information Systems Division
NASA Headquarters
L. Alberts
Buhler Associates, Inc.

2:55

The NASA Customer Data and
Operations Systems
Stanley Sobieski
CDOS Project Manager
NASA Goddard Space Flight
Center

3:20

Break

3:45

End-to-End Data Management
System of the Cluster Soho
Programme (ISTP)
John Credland
Cluster Project Manager
European Space Agency/ESTEC

4:10

COLUMBUS and HERMES
Data Management Systems
Jean-Claude Palous
DMS Engineering Manager
A. Mosnier
MATRA ESPACE

4:35

HST Data Archiving and
Distribution Systems
Mark S. Kauffman
Systems Engineering Manager
HST DADS Project
Ford Aerospace

MONDAY *continued*

PM

2:00

SESSION II C - TECHNOLOGY NEEDS AND PROJECTIONS

Chairman

Lee B. Holcomb
Director, Human Factors and
Information Sciences Division
NASA Headquarters

2:00

Introduction

2:05

Spaceflight Optical Disk
Recorder Development
Thomas A. Shull
Manager, SODR Program
P. Rinsland
NASA Langley Research Center

2:25

High Rate Science Data
Handling on Space Station
Freedom

Richard C. Masline
Member of Technical Staff
T. Handley, Jr.,
C. Ivie, P. Stewart
Jet Propulsion Laboratory

2:45

High Performance VLSI
Telemetry Data Systems
James R. Chesney
Head, Micro Electronics
Systems Branch
NASA Goddard Space
Flight Center

3:05

Mass Memory Technologies
For COLUMBUS DMS

Franz Pitterman
Dipl.-Ing.
H. Reffel, F. Rombeck
Dornier GmbH

3:25

Break

3:40

Data Storage Technologies
for the Future

Stephen M. Ravner
Manager, Optical Disk
and Special Programs
P. Muraco
GE Aerospace

4:00

Advanced Planning for
Technology Insertion

J. Ned Yelverton
Senior Engineer
IBM Federal Sector Division—
Houston

4:20

Technology Development
for the Next Decade

Speaker to be announced
Digital Equipment Corporation

4:40

The High Performance
Computing Initiatives

Chairman
Lee B. Holcomb

PM

5:00

Reception



AM
8:30

**SESSION III A –
LESSONS LEARNED FROM
CURRENT MISSIONS**

Chairman

Peter R. Kurzhals
Director, Utilization and
Operations
McDonnell Douglas Company
Space Station Division

Organizer

Vincent L. Pisacane
Head, Space Department
Johns Hopkins University
Applied Physics Laboratory

8:30
Introduction

8:35
Lessons Learned from the
Hubble Space Telescope
Planning and Scheduling System
Implementation and Operations
Paul J. Ondrus
Head, Mission Operations
Support Office
E. Ruitberg
NASA Goddard Space Flight
Center

9:00
Hubble Space Telescope Science
Operations Experience
Rodger E. Doxey
Division Chief, Science and
Engineering Systems
Space Telescope Science Institute

9:25
Perspectives on NASA Flight
Software Development – Apollo,
Shuttle, Space Station Freedom
John R. Garman
Deputy Director, Information
Systems
NASA Johnson Space Center

9:50
Upper Atmosphere Research
Satellite (UARS) Science Data
Processing Center
Implementation History
K. David Taylor
Project Manager
Computer Sciences Corporation
E. Herring
NASA Goddard Space Flight
Center

10:15
Break

10:40
SPOT Operations Experience
Gilbert Cales
Head, Remote Sensing Satellites
Operations Division
P. Warlop
Centre National d'Etudes
Spatiales
Toulouse Space Center

11:05
The Space Flight Operations
Center – Phase 1 Lessons
Learned
John Gainsborough
Manager, Control Data Systems
Development Section
Jet Propulsion Laboratory

11:30
Evolution of Space Lab
Payload Operations to Space
Station Freedom
Harvey Golden
Assistant Director, Mission
Operations Laboratory
NASA Marshall Space
Flight Center
E. Saenger
McDonnell Douglas Space
Systems Company

AM
8:30

**SESSION III B –
STANDARDS FOR SPACE
DATA INFORMATION
SYSTEMS**

Cochairmen

Edward P. Greene
Information Systems Manager
NASA Headquarters

Hubertus Wanke
Head, Missions Operations
Section
DLR/German Space
Operations Center

8:30
Introduction

8:35
CCSDS: An Approach to the
Definition of Common
Standards for Space Data and
Information Systems

Overview
Edward P. Greene
Information Systems Manager
NASA Headquarters
C. Honvault
European Space Agency

Telemetry and Command
Standards
Klaus Lenhart
European Space Agency
A. Hooke, M. MacMedan
Jet Propulsion Laboratory

Standard Format Data Units
Standards for Data
Understanding
Manfred Drexler
Dipl. Ing.
DLR/German Space
Operations Center
D. Sawyer, G. Smith
NASA Goddard Space
Flight Center

9:35
The Application of Data
Systems Standards to the Space
Station Freedom Project
Joseph F. Smith
Senior Engineer/Scientist
C. Easton
McDonnell Douglas Space
Systems Company

9:55
CCSDS Transfer Frames in the
Realtime NASA DLR Link for
the SPACELAB D-2 Mission
Angelita C. Kelly
Mission Operations Manager
Earth Observing System (EOS)
NASA Goddard Space
Flight Center
M. Drexler, N. Jansen
DLR German Space Operations
Center

10:15
Break

10:45
Application of CCSDS Packet
Telemetry Recommendations
by JPL
Katherine Moyd
Member of Technical Staff
M. MacMedan
Jet Propulsion Laboratory

11:05
Emerging Industry Standards
for Data and Information
Systems
Richard des Jardins
Vice President
Interop, Inc.

11:25
Data Standards for the Space
Station Freedom Program
Lee A. Neitzel
Chief Engineer
CTA, Inc
V. Enos, J. Mallios
McDonnell Douglas Corporation

TUESDAY *continued*

AM

8:30

SESSION III C – ARTIFICIAL INTELLIGENCE TECHNOLOGY AND APPLICATIONS

Cochairmen

Michiro Kusanagi
National Space Development
Agency of Japan

Gregory E. Swietek *Code MT*
Manager, Advanced
Development
Space Station Engineering
NASA Headquarters

Organizer

Jude E. Franklin
Senior Vice President and
General Manager
Technology Division
Planning Research Corporation

8:30
Introduction

8:35
Real Time Data System:
Incorporating Real-Time
Expert Systems Into Manned
Space Flight Operations
Troy A. Heindel
Project Manager of Real Time
Data System
J. Muratore
NASA Johnson Space Center
R. McFarland, UNISYS
Corporation
A. Rasmussen, The MITRE
Corporation

9:05
Applications of AI for
Automated Monitoring:
The SHARP System
David J. Atkinson
Section Manager, Computer
Science & Applications
Jet Propulsion Laboratory

9:35

Launching AI in NASA
Ground Systems
Dorothy C. Perkins
Associate Chief, Mission
Operations Division
W. Truszkowski
NASA Goddard Space Flight
Center

10:05

Knowledge System Tools:
The Invisible Generation –
Architecture for Knowledge
System Development
Katharine C. Branscomb
President
IntelliCorp

10:35

Break

11:00

The Current and Future
Impact of Automation on
Space Programs
Monte Zweben
Deputy Chief, Artificial
Intelligence Research Branch
NASA Ames Research Center

11:30

Shared Autonomous and
Teleoperation Robotics
Niel Duffie
Principal Investigator
Astrobotics Projects
Wisconsin Center for Space
Automation and Robotics

PM

12:00

Luncheon Program

Remarks by
Charles Elachi *invited*
Assistant Laboratory Director
Office of Space Science and
Instruments
Jet Propulsion Laboratory



TUESDAY / 18 September 1990

PM
2:00

**SESSION IVA –
INTERNATIONAL
INTEROPERABILITY**

Cochairmen

Bernard Curbelié
Head of Engineering and
Systems Division
Centre National d'Etudes
Spatiales

Dale L. Fahnestock
Director of Mission Operations
and Data Systems
NASA Goddard Space
Flight Center

Organizer

Georges Jeambrun
Director of the Operations
Department
Centre National d'Etudes
Spatiales

2:00
Introduction

2:05
International Space Network
Interoperability Results
and Status

Dale L. Fahnestock
Director of Mission Operations
and Data Systems
NASA Goddard Space
Flight Center
K. Heftman, ESA/ESOC
M. Kusanagi, NASDA

2:30
Interagency Gateway Services
Gunther Lemmel
DLR/German Space
Operations Center

2:55
Interconnection of Brazilian
REDACE System Network to
International Networks
Eduardo W. Bergamini
Senior Researcher
Instituto de Pesquisas Espaciais
(INPE)

3:20
Break

3:45
Master Data Directories and
Catalog Interoperability
James R. Thieman
Catalog Interoperability Project
Manager
NASA Goddard Space Flight
Center

4:10
GRID – Global Resources
Information Data Base
Charles H. Vermillion
Head, Ocean Data Systems
Office
NASA Goddard Space
Flight Center

4:35
Interoperability Among Space
Station Freedom Data Systems:
A Field Test of Standards
Virginia A. Whitelaw
Software Interfaces Manager
W. Marker
NASA Johnson Space Center

PM
2:00

**SESSION IV B –
SPACECRAFT DATA
SYSTEMS AND
ARCHITECTURES
ADVANCED
COMMUNICATIONS**

Cochairmen

Richard Creasey
European Space
Agency/ESTEC

William Madden
Member, Senior Technical Staff
IBM Federal Systems Division—
Houston

Organizer

Patricia Scott
Program Manager, Marketing
IBM Federal Systems Division—
Houston

2:00
Introduction

2:05
The CCSDS Protocol
Validation Program – Inter
Agency Testing Using LOTOS
Chris Taylor
Senior Engineer
European Space Agency/
ESTEC
M. Gambol
Logica Aerospace and Defence

2:25
MAX: An Advanced Parallel
Computer for Space
Applications
Robert L. Bunker
Deputy Manager, Advanced
Computer Systems and
Technology Section
Jet Propulsion Laboratory

2:45
The Small Explorer Data
System – A Data System
Based on Standard Interfaces
Brian S. Smith
Computer Engineer
NASA Goddard Space
Flight Center
J. Hengemihle
Daedalian Systems Corporation

3:05
SILEX Project Optical
Spacecraft Communications
Michel Faup
Centre National d'Etudes
Spatiales

3:25
Break

3:40
Integrated Network Management
for Space Station Freedom:
A Concept of Services
Management
Joseph F. Smith
Senior Engineer/Scientist
D. Quincey
McDonnell Douglas Space
Systems Company

4:00
An Approach to Data Security
and Privacy for the SSFP
Charles R. Easton
Manager, Space Station
Information Systems
McDonnell Douglas Space
Systems Company

4:20
Telemetry Advances in Data
Compression and Channel
Coding
Warner H. Miller
Senior Electronics Engineer
NASA Goddard Space
Flight Center

4:40
The Tracking and Data Relay
Satellite – The Next Decade
William S. Guion
Chief, Space Network
Project Office
NASA Goddard Space
Flight Center
R. Chang
Stanford Telecommunications,
Inc.

TUESDAY *continued*

PM
2:00

SESSION IVC – SOFTWARE ENGINEERING TECHNOLOGY AND APPLICATIONS

Cochairmen

Dana Hall

Vice President

SES Inc.

Carlo Mazza

European Space Agency/

ESOC

2:00

Introduction

2:05

A User Interface Development
Tool for Space Science Systems
Transportable Applications

Environment (TAE) Plus

Martha R. Szczur

TAE Project Manager

NASA Goddard Space Flight
Center

2:25

Hierarchical Object Oriented
Design (HOOD)

Bertrand Labreuille

MATRA ESPACE

2:45

Earth Observing System (EOS)

Data and Information System

(DIS) Software Interface

Standards

Allan Jaworski

Chief Scientist, Space Programs
Operations

Ford Aerospace

3:05

The European Space Software
Development Environment
(ESSDE)

Adrian J. Scheffer

Head, Mathematics and

Software Division

European Space Agency/

ESTEC

3:25

Break

3:40

FY 90 Status Report on SSE

System Project

James L. Raney

Consultant/Owner

Strategic Systems Planning

4:00

Ada Experience in the Flight

Telerobotic Servicer Project

Steven H. Munkeby

FTS Software Manager

Martin Marietta Corporation

4:20

An Automated Environment for

Multiple Spacecraft Engineering

Subsystem Mission Operations

Khosrow A. Bahrani

Task Manager

Jet Propulsion Laboratory/

CALTECH

4:40

Software Reuse – The Challenge

of the '90s in Software

Developments

Bernard Durin

MATRA ESPACE

PM
5:00

Adjournment



WEDNESDAY / 19 September 1990

AM
8:30

SESSION VA – MULTI-MISSION, MULTI- DISCIPLINE INFORMATION SYSTEM ARCHITECTURES

Cochairmen

Charles F. Fuechsel
Director, Communications and
Data Systems Division
NASA Headquarters

Jean-François Kaufeler
Head of Infrastructure
Telecommunications Branch
European Space Agency/ESOC

Organizer

Barbara Christoph
Manager, Information Systems
SRA Corporation

8:30
Introduction

8:35
Overview of the NASA
Communications Infrastructures
Ray J. Arnold
Director, Communications and
Information Systems Division
NASA Headquarters

8:55
The SPICE Concept: An
Approach to Providing
Geometric and Other Ancillary
Information Needed for
Interpretation of Data Returned
from Spaceborne Scientific
Instruments
Charles H. Acton
Member of Technical Staff
Jet Propulsion Laboratory

9:15
Telescience Concept for
COLUMBUS
Claude Ricaud
Vice Director, Data
Management and Networks
J. Tailhades
MATRA ESPACE

9:35
High Rate Information Systems:
Architectural Trends in Support
of the Interdisciplinary
Investigator
Thomas H. Handley, Jr.
Technical Group Supervisor
L. Preheim
Jet Propulsion Laboratory

9:55
Break

10:15
Multi-Mission Space Science
Data Processing Systems –
Past, Present and Future
William H. Stallings
Associate Chief, Information
Processing Division
NASA Goddard Space
Flight Center

10:35
Intelligent Information
Systems and Interdisciplinary
User Access
Richard S. Carnahan, Jr.
Principal Investigator
Advanced Ground Systems for
Space Based Missions
Martin Marietta Information
Systems Group

10:55
NASA Communications
Augmentation Architecture
Thomas E. Butler
Associate Chief
Communications Division
S. Laios
NASA Goddard Space
Flight Center
J. Ludford
Computer Sciences
Corporation

11:15
Integrated Communication
and Information Fabric
for Space Applications
Jacek Maitan
Senior Staff Scientist
L. Walichiewicz, B. Wealand
Lockheed Missiles and
Space Company

AM
8:30

SESSION VB – DISTRIBUTED PLANNING AND SCHEDULING SYSTEMS AND OPERATIONS

Cochairmen

George Jeambrun
Director of the Operations
Department
Centre National d'Etudes
Spatiales

Giulo Varsi
Manager, Space Automation
and Robotics Program
Office of Technology
Applications
Jet Propulsion Laboratory

Organizer
Rhoda S. Hornstein
Program Manager, Space
Network Control and
Navigation
NASA Headquarters

8:30
Introduction

8:35
Distributed Decision-Making for
Space Station Operations:
A Programmatic Perspective
Rhoda S. Hornstein
Program Manager, Space
Network Control and
Navigation
NASA Headquarters
and
A Technical Perspective on
Tools and Techniques
John K. Willoughby
J. Gardner
Information Sciences, Inc.

9:15
Distributed Planning and
Scheduling for Instrument
and Platform Operations
Larry G. Hull
Computer Engineer
D. Perkins
NASA Goddard Space
Flight Center
E. Hansen, T. Sparr
University of Colorado
at Boulder

9:40

An Approach to Transaction
Management for the SSFP
Charles R. Easton
Manager, Space Station
Information Systems
McDonnell Douglas Space
Systems Company

10:05
Break

10:30
ROSAT Planning System and
Perspectives for the Utilization
of the Space Station
Helmut H. Frank
Group Manager
D. Garton
DLR/German Space
Operations Center

10:55
Results of the Telescience
Testbed Program
Daryl N. Rasmussen
Telescience Consortium Manager
NASA Ames Research Center
B. Leiner
RIACS
A. Mian
GE Government Services

11:20
Information and Control
Infrastructure for the Coming
Space Age
Hiroshi Mizuta
Program Planning and
Management Department
National Space Development
Agency of Japan
A. Ashida, H. Ihara, H. Kato
Hitachi, Ltd.

11:45
Hypercubes for Critical Space-
craft Command Verification
Joan C. Horvath
Magellan Contingency Engineer
Jet Propulsion Laboratory

WEDNESDAY *continued*

AM

8:30

SESSION VC – COMPUTER AND INFORMATION SYSTEMS ARCHITECTURES

Cochairmen

Pierre-Louis Contreras
Deputy Director, Industrial
MATRA ESPACE

Thomas G. Dopplick
Laboratory Scientist/Engineer
Hughes Aircraft Company

Organizer

Robert C. Tausworthe
Chief Technologist
Information Systems Division
Jet Propulsion Laboratory

8:30

Introduction

8:35

High Volume Data Handling and Distribution in the EOS Era

Edward Lesnansky
Scientist
W. Turner
Hughes Aircraft Company

9:00

SOFTBUS – A Way to a Space Standard Software Architecture

Philip David
MATRA ESPACE

9:25

Overview of the Software Replaceable Unit Concept and Mechanisms Supported by the COLUMBUS Data Manage- ment System

Bertrand Labreuille
MATRA ESPACE

9:50

Break

10:15

High Performance Remote Sensing Data Analysis Using Parallel Computation

Jean E. Patterson
Group Supervisor
R. Ferraro, L. Sparks
Jet Propulsion Laboratory

10:40

Data Dictionaries in Infor- mation Systems: Standards, Usage and Application

Margaret Johnson
Member of Technical Staff
Jet Propulsion Laboratory

11:05

The Planetary Data System: A Solution to Data Management for the Planetary Science Community

Elaine R. Dobinson
Technical Group Supervisor
Jet Propulsion Laboratory

11:30

Telescience: Science Processing in the '90s and Beyond

Patricia K. Liggett
Technical Group Supervisor
Jet Propulsion Laboratory

11:55

FISC – A High Speed I/O Computer

Shi-Ping Hsu
Manager, Technology
Development
TRW, Inc.

12:20

Symposium Adjournment

1:30

Tour of the NASA Jet Propulsion Laboratory

GENERAL INFORMATION

SYMPOSIUM LOCATION

The symposium will be held at The Pasadena Hilton,
150 South Los Robles Avenue, Pasadena, California,
91101, USA, (818) 577-1000.

SYMPOSIUM REGISTRATION

The symposium registration fee includes the cost of
coffee breaks, two luncheons, a reception the evening
of Monday, 17 September, a tour of the NASA Jet
Propulsion Laboratory (*limited to 210 guests*) on
Wednesday, 19 September (*this tour is available on a
first-come, first-served basis, attendees must pre-regis-
ter for this event using the enclosed registration
form*), a set of Preprints of all collected papers to be
distributed at the symposium and a Book of Proceed-
ings to be distributed following the meeting.

All attendees must pre-register by mail using the
attached registration form.

By 4 September 1990

NASA Program Participants (Speakers,
Chairmen)/Free

Steering and Program Committee Members/Free

All Other Industry/\$325.00

All Other Government and University/\$275.00

After 4 September 1990

All Attendees/\$350.00

Refunds, *for written cancellations only*, will be pro-
vided if a cancellation notice is postmarked no later
than 4 September 1990.

HOTEL ACCOMMODATIONS

The AIAA has reserved a block of rooms and secured
preferential hotel rates at The Pasadena Hilton for
the nights of Sunday, 16 September to Thursday, 20
September. Room rates are \$75.00 for single and dou-
ble occupancy. By 17 August 1990, all reservations
should be made with the hotel; when making a reser-
vation, delegates should request accommodations for
the AIAA Space Information Systems Conference.
After 17 August, rooms will be released to the general
public and requests will be accepted on a space-avail-
able basis.

SPECIAL EVENT

Tour of the NASA Jet Propulsion Laboratory
Wednesday, 19 October, 1:30 pm - 4:15 pm

Includes transportation by chartered bus, (bus pick-
up—1:30 pm, and drop-off—4:30 pm, at The Pasadena
Hilton), a box luncheon, a welcome and film show-
ing, "Welcome to Outer Space" with an update on
JPL Flight Projects at the Von Karman Auditorium
and a choice of one of the three Technical Tours
listed at right.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	720	HQ/MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	354	HQ/SN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Li, Fuk	334	300-235	4-2849		FLi

	Sec	Mail Stop	Phone	NASAmail	TELEmail
Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA	95204		MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston ✓	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	233-200	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 100 (78 paper, 22 NASAmail) * Printed 25 July 1990

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-561

30 July 1990

TO: Distribution

FROM: Randy Cassingham *RC*

SUBJECT: SS Utilization Team Minutes for 30 July 1990

PRESENT: Rob Staehle, Randy Cassingham, Sima Lisman, Dick Grumm, Hershal Fitzhugh, Gerry Murphy

Next Meeting: 6 August 1990 at 10:30 in 301-271

Note: after next week's meeting, Gerry Murphy will give an overview of last week's Space Station Freedom Environment and Effects Modelling Workshop.

Errata: A word was dropped from an item in last week's minutes regarding the editorial in the *Los Angeles Times* Opinion section by Gregg Easterbrook. The word "assistant" was lost from "J.R. Thompson (currently NASA Administrator)...."

Rob Staehle

The GAO audit is now in full progress. It will likely last for several weeks.

In a call to Rob after the meeting, Jeffrey Webster/GAO indicated that the GAO-initiated general Space Station audit is being slowed considerably to allow the GAO staff to pursue a cost audit requested by Rep. Robert Roe. Roe, the House Science Committee Chairman, asked that the GAO determine how previous budgetary shortfalls and programmatic changes have impacted the Program. JPL is not at present in the plans for the Roe audit. Refer to last week's meeting minutes memo for more details, and for instructions on what to do if contacted for either audit.

Rob was in Washington last week to present the result of the June "Case for Mars" Conference results to Mark Albrecht of the National Space Council. The presentation was led by Carol Stoker/ARC. Dr. Albrecht expressed considerable encouragement for following up on conference results. Originally scheduled for 30 minutes, the discussion with Col. Pete Worden and Dr. Ivan Bekey lasted about two hours.

While in Washington, Rob also met with Jack Collier/MU to discuss progress on Randy Cassingham's *Introduction to Utilizing Space Station Freedom* document task, and Steve Cooke/MT, who encouraged both Paul Henry and Jeff H. Smith to attend the upcoming evolution planning meeting.

Tom Kehoe/JSO has suggested we consider whether JPL should offer to provide parts reliability expertise to help with the response to the EVA/reliability problems cited in the latest Fisher-Price study.

Program Director Kohrs has asked Pete Lyman for a Washington detailee from JPL for Space Station. The position starts in September, and is in the Level I Space Station Operations and Utilization Division, Code MU, for a communications engineer. Anyone with interest in filling this position should express their interest via their division office.

Chet Borden/311 and others will give a presentation on (and perhaps a demo of) the RALPH (Resource ALlocation and Planning Helper) system in Reston on August 7th. If there is sufficient interest, Rob will try to get a local repeat performance. RALPH is a MicroVAX-based, data-driven

scheduling tool that was designed for the JPL Flight Project Support Office to plan Deep Space Network resources. It is used to schedule multiple requests (with multiple priority levels) by multiple users for multiple-but-limited resources.

Thanks to the people asked for carryover plans for continuing tasks; the response to this quick turnaround request for information was quite good. The prospects for extra carryover funding, however, looks poor. Accounts which run out of money will be closed in order to not penalize those who plan ahead for this time.

Sima Lisman/Gerry Murphy

Sima and Gerry spent most of last week at the Space Station Freedom Environment and Effects Modelling Workshop, which Gerry hosted in Pasadena. It went quite well. The attendees broke into four working groups: modelling software standards, overall requirements, physical models, and quality assurance/documentation standards. The workshop was co-funded by Codes MSE and MSU. Dana Brewer/MSE and Kevin Schaeffer/MSU represented the sponsors. William Taylor/M also attended. GSFC and JSC were conspicuously limited in their representation. About 60 people attended, of which only about 10 were JPLers. The others represented several organizations, including NASA HQ, the International Programs Office, Maxwell Labs' S-Cubed Division, MIT, SEA, and the University of Toronto.

There has been a problem in the past in that there are multiple environmental control boards at the Centers for various disciplines and environments, but the various models are not well-coordinated, especially if a particular issue is not clearly within a single control board's purview. Dana Brewer seemed impressed with the cohesive approach of the workshop, and will recommend more funding for this activity from Moorehead. Moorehead has recently agreed to support the effort, but has not yet released funds. The intent of this coordination effort is to reduce costs to the Program of meeting environmental constraints and realities in such areas as neutral plasmas, electromagnetic interference, and microgravity disturbance.

Gerry plans to prepare a management overview report on results this week, and will present this overview after next week's meeting (the meeting starts Monday at 10:30 in room 301-271).

Sima noted that she won't make it to next week's meeting as she has been invited to McDonnell Douglas in Huntington Beach to demonstrate her Disturbance Simulation and Management Tool.

Dick Grumm

Dick is trying to put together the Code SN Spacelab-to-Space Station transition study. The Science Utilization and Management team has agreed to supply the data he needs for the study, namely a Station resource overview. A kickoff meeting for the study is tentatively scheduled for August 22 at MSFC. The study is being coordinated by the Microgravity Program Support Office at LaRC, funded by Code SN. Kristan Lattu will be leading JPL's work, with assistance in a few engineering discipline-specific areas.

Hershal Fitzhugh

Despite being away on a grueling, long vacation sailing in the Caribbean, Fitz managed to attend the Spacelab MMDR (Mission Management and Director's Review) meeting last week. The entire two days was spent discussing how Spacelab mission management experience might translate to Space Station mission management. ARC, JSC and MSFC gave overviews of their various mission management processes; most notably, ARC's mission management documentation (where users document requirements conformance) for a particular experiment resulted in about a quarter-inch of paper to JSC. For MSFC's process, ARC was required to produce about two inches of paper -- both were responding to the same requirements. Fitz hopes that the result of this comparison will be some big changes in mission management practices -- hopefully in the direction of reducing and standardizing paperwork.

Fitz has found Harry Craft/MSFC to be very cooperative in listening to suggestions for improving the mission management process. Chuck Lifer/354 talked about structures requirements he helped write earlier in his career at MSFC, and has since been required to respond to from his position at JPL. His suggestions for improvement were welcomed by MSFC personnel.

It was noted at the meeting that in recent months, MSFC's contractor, Teledyne Brown, has become very responsive to completing full responses to user documentation before deadlines.

Fitz was quite complimentary about the way KSC is doing things, except for one shortcoming: they have only recently begun to pay attention to electrostatic discharge issues. Their handling of payloads in the past has been a problem (e.g., with JPL's ASTRO star tracker), with payload equipment being placed in non-ESD-safe packaging, personnel not being properly grounded, etc.

Fitz was to attend the UDAWG meeting for U.S. Laboratory Module at MSFC which starts today, but had some last-minute problems which prevented his travel.

Upcoming Meetings

August 2: Telecon to discuss the OSSA Training Concept paper and the training management plan. Dick Grumm will participate.

August 22 (tentative): Spacelab-to-Space Station transition study kickoff meeting at MSFC. Kristan Lattu and Dick Grumm to attend.

August 27-28: Semi-annual Space Station Utilization Project Review at HQ. Rob Staehle, Hershaf Fitzhugh and Bob White to attend.

August 29: SUM Director's Review at HQ. Rob Staehle, Hershaf Fitzhugh and Bob White to attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. There will be numerous JPL speakers and attendees. The agenda was attached to last week's minutes.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos not corrected...)

This is DAILY NEWS IN BRIEF for July 27, 1990. It is intended for internal agency use only.

ASSOCIATED PRESS -- July 27

"COSMONAUTS" By Brian Friedman

"Two cosmonauts have repaired a bulky hatch that bedeviled them and dangerously prolonged a previous spacewalk earlier this month, according to Soviet news reports.

AP's Moscow bureau reports Soviet Soyuz/Mir ground controllers attributed the problem to human errors which occurred at the start of the previous spacewalk on July 17 when cosmonauts went outside the Mir to fix insulation which had become loose on their Soyuz spaceship.

The wire says that Soviet television carried live shots of the Mir crew performing the work and that ground controllers had said they would be monitoring cabin pressure in the airlock module to ensure the hatch has -- in fact -- been properly closed.

AP cites a Soviet Tass news service report which indicated the Mir crew has accomplished 506 of 520 scientific experiments scheduled, has photographed over 8.4 million square miles of Earth's surface and succeeded in growing 23 crystals in space.

ASSOCIATED PRESS -- July 26

"APOLLO-SOYUZ REUNION" By Marcia Dunn

"One of the Soyuz cosmonauts who met with Apollo astronauts 140 miles above Earth 15 years ago this month said Thursday that U.S. and Soviet spaceships need a compatible docking system."

AP's Cape Canaveral reporter quotes Alexei Leonov, who was Soyuz commander during the ASTP mission, as saying "if we want to come visit each other or help each other, it's impossible. If something happens up there in space, an accident, people will say we're not very smart. It's not technically complicated. It's only agreement between us, nothing else. Planes save each other. Ships save each other. But spaceships don't. Why? Why?"

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-572

13 August 1990

TO: Distribution

FROM: Lori Paul

SUBJECT: SS Utilization Team Minutes for 13 August 1990

PRESENT: Rob Staehle, Neil Divine, Hershaf Fitzhugh, Dick Grumm, Chuck Ivie, Sima Lisman, Lori L. Paul

Next Meeting: 20 August 1990 at 10:30 in 301-169

Notice: Since Building 301's second floor conference room is being converted to offices, the Space Station Utilization Team meetings will be held in varying locations from now on. Please check the line above carefully each week to see where the next meeting will be held!

Rob Staehle

A "boiler room effort" is in progress to reduce weight and power requirements at Level II.

A Level II Reston telephone list is now available. Contact Lori Paul at 4-1166, 601-237 to obtain a copy.

California State University Long Beach is hosting Space Conference 1990, Saturday 22 September 1990. Rob will chair an afternoon session, "International Space Station Freedom," and a panel discussion, "Review of Technical Issues." Several notable persons will be making presentations including:

Dr. Bill Raney, Space Station Office NASA Headquarters -- "The International Space Station Freedom" and "Scientific and Commercial Uses of the Space Station"

David J. Bell/339 -- "Communications for Mars Orbiter Relay Satellites"

Marguerite Schier/322 -- "Earth Observing System"

Ed Repic, Space Systems Division of Rockwell International -- "Space Exploration Initiative"

Representatives from McDonnell Douglas, Boeing Aerospace, and Allied-Signal Aerospace Company will also be making presentations at the conference.

Chet Borden/311 reported to Reston on the RALPH (Resource ALlocation and Planning Helper) Freedom Assembly Sequence Tool (FAST). Moorehead has asked for a presentation on this tool.

Ed Reeves/SM made a presentation for OSSA on Small Rapid Response (SRR, formerly SARR) payloads to the Space Station Science and Applications Subcommittee (SSSAS) back in June of this year. OSSA is currently funding a SRR Study Office as a precursor to a formal Project Office which will be established later this year.

The Fisher/Price report, "Space Station Freedom External Maintenance Task Team Final Report, Part I and II", by Dr. William F. Fisher and Charles R. Price, has been published. Contact Lori Paul at 4-1166, 601-237 to borrow this document (note, it has been published in two large volumes).

In summary, the report states that the Space Station (as currently configured) will require 2,000 to 3,000 hours per year of EVA time to repair broken equipment outside the pressurized modules. This EVA estimate does not include assembly time or preventative maintenance. Science Applications International Corporation (SAIC) was asked to review the Fisher/Price report. SAIC largely endorsed the methodology and conclusions in the study. Mac Reid/100 served on the committee which evaluated the SAIC analysis of the report. The committee was chartered to judge the accuracy of reliability numbers used in the report. They were not asked to review Space Station management or other issues, only the fundamental data cited in the report.

Rob stated that there is some concern over the reliability of the Intel 80386 processor for space applications. Dave Smith/240 and Chuck Ivie have said it is their understanding that the processor may be particularly susceptible to single event upset problems. Originally, contractor bids (e.g., IBM) for production of Space Station software were made with the assumption that programmers could design software for the 80386 processor, a processor with which many people are familiar. Also, the 80386 is currently planned to be the principle processor for the NIUs on the Station. Chuck Ivie stated that IBM has proposed an interesting solution to the single event upset problem: power down and restart all 80386 processors on the Station every 750 milliseconds during their operational lifetime. Chuck explained that certain types of radiation-induced hard failures in a processor gate may cause a cumulative failure in adjacent gates which would, in turn, produce a "contagious" chain reaction of processor failures. This was the reason offered for the power up/down mode of operation, i.e., to power down the processor before failures have a chance to propagate. A repeated power up/down process would have serious impact on software development for the Space Station. The advantages in speed and software commonality of using 80386 processors may be negated if the power up/down mode severely reduces the operational efficiency of the processor. No existing 80386-based machine is known to operate in such a power up/down mode. Rob was concerned that stopping and starting the processor every 750 milliseconds might actually increase the rate of processor failure.

The 506 funding authorization for the Vibro-Acoustic Payload Environment Prediction System (VAPEPS) work has left Reston and is on its way to Level I at NASA Headquarters for an anticipated quick final approval. The funds are expected to arrive at JPL quite soon.

JSO briefed the Network and Information Systems Integration Panel on the soon-to-be chartered Communications Systems Engineering Panel (CSEP). In addition to describing CSEP, the presentation highlighted the differences between CSEP and the Station Communications and Data System Integration Sub-Panel (SCADSI). CSEP will focus on Level II requirements on the end-to-end communications systems while SCADSI will focus on implementation options and design. The initial task of CSEP will be the restructure of the PDRD Section 7. Chuck Ivie is doing much of the rewrite for Mike Divirian/JSO and Bob Vuolo/JSO. The first meeting of CSEP will convene in late August or early September, after the completion of the restructure draft of Section 7. Chuck will attend.

Rob cautions everyone to watch spending very carefully. The carryover situation has not changed and funds will not be forthcoming for the first 6 to 8 weeks of FY91.

Dick Grumm

Donald W. Lewis/797 will head a Spacelab-to-Space Station Transition Study funded by Code SN. The first meeting of the study team will take place at MSFC in Huntsville on 23 August. The meeting will follow the Space Station Furnace Facility Conceptual Design Review (CODR), also taking place in Huntsville. Dick has indicated the willingness of Kristan Lattu/374 and Chuck Ivie to support this study with their Space Station expertise.

Dick is in the process of reviewing the recently published "Rack Integration Manual." (Hershal Fitzhugh will be sending a copy of this document to the JPL Space Station Library. Contact Lori Paul at 4-1166, 601-237 for a copy.) There is still some concern that racks have not yet been standardized in either a metric or English (inches) measurement system. Fitz stated that the Japanese partners have recently begun referring to racks in inch measurements. There is apparently no way to convert inches into "even" or standard increments of metric units. "Soft metric" is the conversion of inches

into odd fractions of metric units which are then used for construction, etc. "Hard metric" is the use of standard increments of metric measurement with no origination in English units of measure. The controversy over using "soft" or "hard" metric measurement, English measurement, or some combination of both systems on the Station continues.

Mark Foster/McDonnell Douglas is looking for someone at JPL with telerobotics servicing expertise to assist in gathering user requirements information. Rob suggested that Wayne Schober/881 might be helpful.

Chuck Ivie

Chuck is continuing his review of Volume 7, Sections 1-5 of the PDRD. By close of business this Wednesday (15 August), he will have a finished evaluation for JSO. Since Bob Vuolo/JSO is on vacation, Chuck will be sending his review directly to Mike Divirian/JSO and Mohamed Osman/JSO in Vuolo's office.

Sima Lisman

Sima held a demonstration of the Disturbance Simulation and Management Tool (DSMT) for McDonnell Douglas in Huntington Beach. The meeting was coordinated by Jim Rehcoe/McDonnell Douglas, who works for Fritz Runge. A discussion followed the demonstration. A beta test version of the DSMT has been made available at no charge for those who wish to examine and test the software. The DSMT User's Guide is now available and will be distributed over the next few days. MDSSC has requested the beta test software and User's Guide.

Sima will be absent for the next two weeks on travel to a conference. It is uncertain whether or not she will continue to work on Space Station until a replacement is identified.

Hershal Fitzhugh

The Work Package-01 PDR is in progress. Fitz is sending 10 boxes of PDR documents to the JPL Space Station Library.

The Space Station Utilization Program Review will take place 27-28 August, followed by the Science Utilization Management (SUM) Director's Review on 29 August, at NASA Headquarters. Fitz, as the JPL SUM representative, will make a presentation at the meeting and give a summary of the Mission Management Director's Review.

Re-costing is in progress for the ARC Exobiology Intact Capture Experiment (EXOICE), an experiment which will capture cosmic dust for analysis. Peter Tsou/313 is co-investigator. Current estimates of cost indicate that flying a coffee cup (equivalent in size and weight to EXOICE) on the Station would cost a total of 12 million dollars.

Lori Paul

TMIS connectivity efforts continue. If TMIS is not up and running at JPL within one week, Lori will set up a meeting with Jim Jacobson/372, Rob, and Dr. Marshall "Mickey" Alper/170. Dr. Alper may be able to assist in solving some of the long term problems with TMIS.

Neil Divine

At the apologies to Dr. Divine for the incorrect spelling of his name in the last meeting minutes.

At the request of Jeff Anderson/MSFC, Neil participated in the Debris Environment Review for Space Station which took place at JSC 10 August 1990. New specifications for modeling the debris environment around the Space Station were evaluated. Official members of the Technical Coordinating Committee, responsible for the review, were: A. Potter (Chairman, JSC), J. Anderson

(MSFC), D. Humes (LaRC), D. Kessler (JSC), and J. Krolecki (LeRC). Other participants included: P. Anz-Meador (Lockheed, Houston), N. Divine (JPL), Carl Henize (JSC), N. Johnson (Teledyne Brown, Colorado Springs), J. Loftus (JSC), R. Neider (JSC), F. Ojakangas (Lockheed, Houston), and John Stanley.

Once in orbit, the Space Station Program Elements (SSPEs) will encounter micrometeoroids and space debris. Meteoroids are objects of entirely natural origin, while debris is human-generated material remaining in Earth orbit. Either type of object can pose a serious threat of damage or decompression to a SSPE upon impact. For historical reasons related to measurement method, the meteoroid and debris environments are usually specified as fluxes; F_r against a single sided, randomly tumbling surface. Flux is defined as the number of intercepted objects per unit time and area. For F_r , the relevant area is the actual surface area of a satellite.

New debris specifications strongly resemble the familiar Kessler model (NASA TM 100 471, Kessler, et al., April 1989), although three significant modifications have been included:

1. Optical data, recently available from GEODSS telescopes, have led to a modest increase in flux (up to a factor of 3) for diameters between 1 and 10 cm.
2. Debris growth factors have been adjusted to modestly smaller rates (although uncertainty regarding future increases in debris remains very large).
3. Additional specification for the velocity distribution has been included.

Unfortunately, LDEF debris data are not yet available for inclusion in the new specification model.

Although no formal vote was taken at the review to recommend or reject the proposed debris environment specification changes, there was a strong consensus that the new specification should be adopted as a major improvement over the existing Space Station debris description (which is now several years old because a prior attempt to make a formal specification change failed in 1988 and 1989). Additional changes to the debris model can be anticipated as more data become available. Future action to adopt a new debris environment specification will be taken by the Orbital Debris Steering Group.

A draft of the proposed new debris environment specification is available for review. Contact Lori Paul at 4-1166, 601-237 to obtain a copy.

Upcoming Meetings

August 21: Evolution Working Group meeting at JSC. Paul Henry to attend.

August 22 (tentative): Spacelab-to-Space Station transition study kickoff meeting at MSFC. Kristan Lattu and Dick Grumm to attend.

August 27-28: Semi-annual Space Station Utilization Project Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.

August 29: SUM Director's Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.

August TBD: Communications Systems Engineering Panel (CSEP) meeting. Chuck Ivie will attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. There will be numerous JPL speakers and attendees. The agenda was attached to last week's minutes.

There were no Space Station-related items from Code P's "Daily News in Brief" this week.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

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Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
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Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	HQ	Code MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
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Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Lewis, Donald W.	797	183-801	4-0840		

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Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204			MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
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Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
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Tai, Wallace	317	301-235	4-7561		
Taylor, William	HQ	Code M-8			
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
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Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
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Total: 102 (80 paper, 22 NASAmail) * Printed 15 August 1990

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-567

6 August 1990

TO: Distribution

FROM: Lori Paul

SUBJECT: SS Utilization Team Minutes for 6 August 1990

PRESENT: Rob Staehle, Paul Henry, Gerry Murphy, Lori L. Paul

Next Meeting: 13 August 1990 at 10:30 in 301-127

Notice: Since Building 301's second floor conference room is being converted to offices, the Space Station Utilization Team meetings will be held in varying locations from now on. Please check the line above carefully each week to see where the next meeting will be held!

Rob Staehle

NASA/JSC has formed a Universities Space Automation and Robotics Consortium in Texas. The consortium includes Rice, University of Texas, University of Texas/Arlington, and others. All sites will be interconnected so that each can control the robots at the other sites.

Jeff Anderson/MSFC, chair of the Neutral Environments Working Group (Level II), has asked Dr. Neal Divine/521 to participate in their 10 August meeting. (Neal developed the original micrometeoroid models that are used by all JPL interplanetary missions.)

The European Space Agency publication, "Columbus Logbook," has an article in its May 1990 edition titled "Columbus: Preparation for Utilization" by Fredrik Engstrom, ESA Director of Space Station and Microgravity. Contact Lori Paul at 4-1166, 601-237 to obtain a copy of this article.

The JSC Lunar Mars Exploration Program Office is publishing a newsletter, "The Explorer." If interested in subscribing, contact Mike Duke via his NASAmail box MDUKE.

Paul Henry

Last week Paul attended a meeting of the Evolution Working Group's Operations and Configuration Splinter Groups. Several topics were discussed:

Steve Cook/ST announced a proposed budget for Code MT of \$16 million. As current matters stand, a cut in this initial budget is expected. A cut of at least 10% was predicted.

The Evolution Working Group has been invited to observe a McDonnell Douglas Space Systems Company underwater test facility demonstration of aerobrake assembly in Huntington Beach, California, on 8 October 1990. The demo will involve a combined robotics and EVA activity. This event will be widely covered by the media (CNN, Aviation Week, etc.)

Rudy Saucillo/McDonnell Douglas discussed a Power Growth Study (referring to an evolutionary growth in power generation and distribution on the Station). Growth utility trays present a problem. Presently planned utility trays are not configured so that they can be expanded. When additional power is added (such as the addition of a solar thermal dynamic module), a new utility tray becomes necessary. Physical room for the large trays (which are approximately 60 inches wide) may be a problem.

Paul suggested that another look should be taken at high efficiency photovoltaic (PV) technology. Rob said that high efficiency PVs were evaluated recently by Mukund Gangal/JSO, et al. The Program did not accept a recommendation to use the PVs in favor of solar dynamic module systems. Paul stated that the advertised efficiency of the solar dynamic module is outstanding, if one accepts the efficiency figures as fact. There is some concern that actual performance in space may not live up to expectations, especially when the duty cycle is factored in.

Paul Cooper/LaRC made an interesting presentation regarding dynamics and control at the Operations and Configuration Splinter Working Group meeting. Apparently there are major structural problems involved in hanging the solar dynamic modules on the end of dual keel Station struts. Further, these structural problems would be exacerbated when massive Mars or Lunar vehicles are docked to the Station. His analysis showed that currently planned struts would need to be structurally strengthened at certain sites in order to adequately support the modules.

Robotics specialists from KSC reported on their on-orbit assembly and servicing work. Cate Heneghan/311 attended for Jeff H. Smith/311 and presented their work regarding advanced robotics for in-space vehicle processing. Her presentation was well received, particularly by the Langley attendees. Assembly and servicing work seems to be moving in the direction of mixing robotic and EVA approaches. The JPL work was complemented for its likely realism.

The Evolution Working Group will meet on 14 August (next Tuesday) in Houston and hear reports from the Systems splinter groups. An agenda for this meeting is pending. Paul or an alternate will attend.

Paul will be delivering the next draft of the Level I utilization plan to Code MU this week. He hopes to receive comments early the following week so that a final version can be delivered by approximately 17 August. Paul will be going on vacation in late August.

Gerry Murphy

Gerry's Space Station Freedom Environment and Effects Modelling Workshop was successful and productive. Gerry has prepared a management briefing ("A Space Station Freedom Environment Definition and Assessment Program for Level II") which summarizes the results of the workshop. This preliminary presentation will be followed by a full report. (See selected pages of the briefing viewgraphs attached to the minutes.)

The purpose of the Environment Workbench (EWB) activity is to help the Program devise the best design solutions for mitigating the detrimental effects of various environmental characteristics on the operation of Space Station equipment. The neutral, plasma, and debris environments in orbit -- along with Shuttle and Station outgassing, thruster exhaust, leakage, and electromagnetic emissions, for example -- all impose potential serious problems for Station operation. These environmental factors must be properly accounted for during the design and testing process. The EWB will provide a consistent and adequate set of tools and methodology across the entire Program which will allow designers with various discipline responsibilities to implement system-wide solutions to the potential problems induced by the Station's operating environment.

Lori Paul

Jim Jacobson continues to work on establishing TMIS connectivity for JPL. The TMIS service request remains open until this occurs.

Randy Cassingham

Randy forwards an interesting letter to the editor of *Space News* (July 30th issue):

Station Wisdom

There seems to be a great deal of confusion lately about the space station's feasibility. If anyone is interested, there are some basic principles for the design and

management of space station programs that have been developed during the 20th century:

- Initial assembly mass is irrelevant; resupply mass is relevant.
 - Redundancy provides reliability.
 - Modules make sense; commonality does not.
 - Deployment makes sense; in-space assembly does not.
 - Electrical power, crew time, data transmission and storage capacity will always be in short supply.
 - Automation makes sense.
 - A human presence can be useful.
 - Incremental growth makes sense; incremental budgets do not.
 - Design and development costs will be eclipsed by transportation and operation costs within five to 10 years.
 - Every \$100 million shaved off an honest and accurate budget will cost \$300 million later and cause a 3-month delay.
 - When program cost, content and schedule are all constrained for political reasons, the only thing left to increase is technical risk.
 - Safety is subjective.
 - Somebody, somewhere, has to decide priorities among user requirements.
 - Decisions deferred in phase B cause episodic crises in phase C.
- The effect of institutional and political inertia upon technical decision making should not be underestimated.

Adam Gruen
Project Director
Space Station History Project

Upcoming Meetings

- August 14 Evolution Working Group meeting. Paul Henry or Kent Volkmer to attend.
- August 22 (tentative): Spacelab-to-Space Station transition study kickoff meeting at MSFC. Kristan Lattu and Dick Grumm to attend.
- August 27-28: Semi-annual Space Station Utilization Project Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.
- August 29: SUM Director's Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.
- September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. There will be numerous JPL speakers and attendees. The agenda was attached to last week's minutes.

Recent Space Station-related Items from Code P's "Daily News in Brief" (Typos not corrected...)

SPACE NEWS -- July 30

"EVALUATIONS FIND STATION CONTRACTORS BELOW PAR" By Andrew Lawler

"NASA has uncovered deficiencies in the performance of three of its major contractor teams responsible for designing and building the space station, according to agency and industry officials. The teams recently received mediocre or low scores in evaluations of their efforts by station managers."

According to Space News, the most pressing concern is with Grumman Corp., Bethpage, N.Y., which serves as support contractor to the space station program office in Reston, Va.

Space News says that a biannual evaluation of Grumman completed in June gave the contractor good marks for its support activities at Reston but much poorer marks for its integration activities.

The newsweekly cites Grumman sources who say the problem stems from NASA's recent reliance on Grumman to perform more integration activities to help make up for a lack of civil service positions at Reston. According to Space News, Grumman recognizes the problems in its contract and has indicated it is working to resolve the difficulties in the systems integration area.

Space News also reports that McDonnell Douglas Corp., the principal contractor for Johnson Space Center's station work and Boeing Aerospace Co., principal contractor for the crew modules, both received low marks but cites responses from both companies indicating they are working to resolve the difficulties.

The story concludes by suggesting that the Grumman difficulty could precipitate a major adjustment in space station management -- perhaps sparking a move to place more integration responsibility at Johnson Space Center. If that happens, Space News suggests the Congress may lose faith in the program.

ASSOCIATED PRESS -- July 31

"SOVIET LAUNCH"

"Two cosmonauts to be launched to the Mir space station will walk in space to conduct repairs on a hatch that has troubled the crew they will replace, Tass said today."

AP reports that the launch of a Soyuz TM-10 capsule will occur at 1:32 p.m. Moscow time from the Baikonur Space Center in Soviet Central Asia and will ferry Lt. Col. Gennady Manakov and engineer Gennady Strekalov up to the Mir.

The wire reports that the current crew of Mir, Anatoly Solovyev and Alexander Balandin, will return to Earth on August 9.

AP reports that the new crew will be the seventh to visit and staff the Mir, which became operational in 1986.

ASSOCIATED PRESS -- August 1

"SOVIET SPACE"

"Two cosmonauts rocketed into space today to replace a two-man crew aboard the orbiting Mir space station, the Tass news agency announced."

AP's Moscow bureau states the Soviet Soyuz TM-10 spacecraft was launched from the Baikonur Space Center at 1:32 p.m. Moscow time and was on schedule and that the crew was expected to dock with the Mir after two days in orbit.

The wire report says the new crew is expected to stay aboard the Soviet space station for 4½ months and that the captain of the new crew, Lt. Col. Gennady Manakov, is a rookie but the engineer, Gennady Strekalov, has been on three previous space missions -- including one aboard the Salyut space station.

AP quotes the Tass report and says the new crew is expected to make at least two spacewalks to further repair the hatch on Mir and will conduct an additional 250 experiments, some of which will be a continuation of experiments which have been conducted by the current Mir crew, who will return to Earth on August 9.

SPACE NEWS -- July 30-August 5

"EUROPE WARY OF STATION MAINTENANCE PROBLEMS"

"European space station officials are reacting cautiously to a NASA finding that the station will require an excessive number of space walks to remain in working order. One official said the NASA figures are unrealistic because they assume every possible worst case scenario will occur."

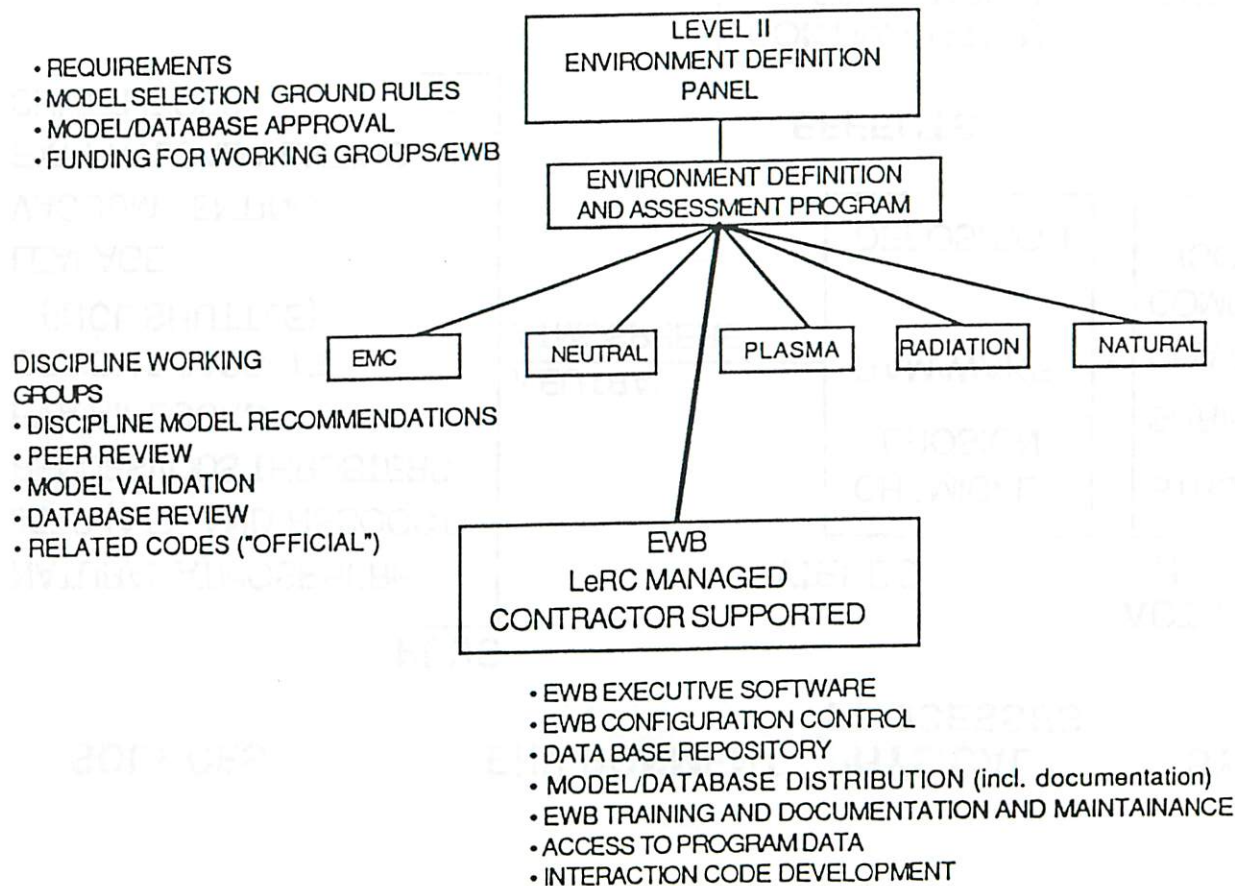
The newsweekly says a high-level delegation from the European Space Agency will be in Washington this week to discuss the impact of the maintenance report and to go over NASA's 1991 budget prospects and its possible impact on space station schedules.

The paper quotes ESA Columbus project chief Lanfranco Emiliani as saying "everybody agrees there are too many EVA hours and it's now a question of taking measures to reduce the need for them."

EDAP AT LEVEL II

• PURPOSE:

- ASSURE CONSISTENT ANALYSES ACROSS THE PROGRAM DURING DESIGN, VERIFICATION, AND UTILIZATION PHASES. PROVIDE FOR COMPREHENSIVE ASSESSMENTS THAT CROSS WORK-PACKAGE AND DISCIPLINE BOUNDARIES.
- DEVELOP, ORGANIZE, CONTROL, AND DISTRIBUTE A CONSISTENT, COORDINATED SET OF ENVIRONMENT DEFINITION, INTERACTION, AND EFFECTS MODELS/ TOOLS/ DATABASES.



SOURCES

ENVIRONMENT

PHYSICAL PROCESSES

SYSTEMS

PLUS

NATURAL ATMOSPHERE
JETS (ATT. AND REBOOST)
RENDEVOUS THRUSTERS
EVA AIRLOCKS
OFF/OUT GASSING
(INCL SHUTTLE)
LEAKAGE
VACUUM VENTING
EXT PAYLOAD VENTING
SHUTTLE OPS

NEUTRAL
ATMOSPHERE

YIELDS

CHEMICAL
EROSION
RAM/WAKE
DEPOSITION

**ACTING
ON**

STRUCTURES
SURFACE MATERIALS
COATINGS
COMPLEX SURFACES
(SOLAR ARRAYS)

EFFECTS

TO PRODUCE

CONTAMINATION
(REFLECTION, ABSORPTION,
EMISSION)
MATERIAL LOSS
THERMAL CHANGE (A/E)
INSTRUMENTATION
(ACCURACY, SENSITIVITY)

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	HQ	Code MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314	4-3952		
Glazer, Stu	HQ	Code SN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Li, Fuk	334	300-235	4-2849		FLi

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Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA	95204		MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	161-135	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Schutz, Frank	790	183-801	4-5738	FSchutz	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Taylor, William	HQ	Code M-8			
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Turner, Dick	313	233-306	4-5643		Dick.Turner
Urban, Mike	120	Reston ✓	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	233-200	4-6786	RHWhite	
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 101 (79 paper, 22 NASAmail) * Printed 8 August 1990

JET PROPULSION LABORATORY**INTEROFFICE MEMORANDUM**

311.4-575

20 August 1990

TO: Distribution

FROM: Lori Paul

SUBJECT: SS Team Minutes for 20 August 1990

PRESENT: Rob Staehle, Hershal Fitzhugh, Chuck Ivie, Kristan Lattu, Gerry Murphy, Lori L. Paul

Next Meeting: 10 September 1990 at 10:30 in 301-376

Notice: Due to travel by Rob Staehle and Paul Henry, there will be no meeting on Monday, 27 August.
Due to the Labor Day holiday, there will be no meeting on Monday, 3 September.

Rob Staehle

Please note the OSSA Space Station payload policy letter attached to the minutes. It was received after the meeting.

At the next meeting on 10 September, Cate Heneghan/311 will present the results of the "Advanced Robotics for In-Space Vehicle Processing" task. Potential for reductions in EVA time and related issues will be discussed.

Paul Henry will take a break during his vacation to attend the 21 August Evolution Working Group (EWG) meeting in Houston. He will propose that a low-latency link be considered for external robot applications. As currently planned, robots outside Station modules would be controlled by crewmembers inside the Space Station. The need to supervise robotic activity from the Station increases existing problems in scheduling limited crew time. In fact, activities performed by robots may take longer than identical activities performed by humans, thus robotic activities might actually absorb more crew time than EVAs. (Though robotic activities may be cheaper, and are certainly safer for the human crew, than EVAs.) It would be substantially more advantageous to control robotic work from the ground; however, the minimum 6+ second latency in the current command link makes ground-based robotic control impractical. A low latency link would make ground-based robotic control feasible. There is concern on the part of Operations and Safety, however, that reducing latency may increase the risk of potentially hazardous robotic activities on the Station.

Paul Henry has delivered the third draft of his Space Station Utilization near-term plan to Barry Epstein/MUU for Remer Prince/MUU who will give the plan its final review.

Bob Easter has distributed FY91 JSO Resource Guidelines. JPL task managers should discuss the guidelines with their Reston task managers.

A tour of Rockwell's Downey facility for the Space Business Roundtable has been scheduled for 7 September. Full size orbiter and Space Station habitation module mockups will be seen. Anyone interested in attending should call Rob.

Rob asked Gerry Murphy and his colleagues to review a Change Request, "Environmental Monitoring Plan for Hazardous Payloads" (CR #BJO20399). The evaluation of this CR is due to Bob Glass/JSO by close of business 24 August.

Bob Laskin/343 is reviewing a Microgravity Environment Definition Report for Bob Edelson/JSO.

From Al Webb/JSO

"FROST Analysis of Virtual Channels," has been released by JSO. The report was prepared for Jeff L. Smith and Al Webb by the FROST Analysis Study Team (FAST) comprised of Bob Aster/311, Govind Deshpande/311, and James Michael de Pitahaya/311. The report documents an analysis designed to determine the performance impact of increasing the number of virtual channels (VCs) per Data Management System (DMS)/Communication and Tracking System (C&TS) low rate data interface port from one to eight. The FROST model was used to simulate the performance of components of the C&TS which could be affected by increasing the number of VCs per DMS/C&TS port. The analysis was performed in support of a JPL Systems Office study to determine the number of VCs per port necessary to provide sufficient ground data distribution flexibility throughout the Space Station's lifetime.

The FROST analysis demonstrates that eight VCs of return data per DMS/C&TS port can be supported by the C&TS, with effective throughput at least 95% of the throughput with one VC per port, as long as the time out interval of the Baseband Signal Processor Network Interface Unit is increased from 3.5 to 50 milliseconds. This will have no impact on the latency of most of the data transmitted, and less than a 2% increase in worst case latency for some packets. The analysis also estimates the possible increase in the Customer Data and Operations System (CDOS) processing workload for low rate data if sufficient VCs are not available for data distribution.

Contact Al Webb at (703) 487-7589 (FTS 457-7589), or Jeff L. Smith/311 at JPL extension 4-1064, if you need further information or want a copy of this report.

Gerry Murphy

Gerry is discussing new work with his MSU sponsor, which may augment his ongoing activities.

Hershal Fitzhugh

Fitz is preparing for the Science Utilization Management (SUM) Program Review which will take place 27-28 August at NASA Headquarters. (He will also attend the SUM Director's Review on 29 August that immediately follows the SUM PR.) At the SUM Program Review, Fitz will present an overview of the recent Mission Management Director's Review (MMDR) and Space Station Utilization mission management activities and future plans. Rob Staehle will attend both the SUM Program Review and SUM Director's Review. Fitz will also make a presentation regarding continuing payload classification results and proposed OSSA implementation of NMI 8010.1A of the SUMDR.

Re-costing is still in progress for Ames' Exobiology Intact Capture Experiment (EXOICE), an experiment which will capture cosmic dust for analysis.

Chuck Ivie

Section 7 of the Program Definition and Requirements Document (PDRD) is now in its final draft form. A majority of Chuck's contributions have been incorporated in the document, and he feels it is a good product. The content of Section 7 has essentially remained the same; however, the format and organizational emphasis on certain issues has been restructured and continuity has been improved. The document will be distributed for internal review by JSO Level II this week. Mike Devirian/JSO already has a copy. After JSO's review, Section 7 will be distributed for general review throughout the program and final approval by Moorehead. It becomes a "RIDdable" document at that point and part of SSFP 30,000 PDRD series.

Chuck Brady asked Chuck Ivie to comment on the consequences of removing Reed-Solomon encoding capability from the Space Station, an action which would result in a 10^{-5} bit error rate. (Apparently there is feeling in some quarters that development of the Reed-Solomon encoder/decoder chip is very expensive and that bit error rates of less than 10^{-5} are extravagant and unnecessary for operation of the Station.) It is Chuck's opinion that the loss of Reed-Solomon core capability would

result in the need for individual users to perform their own error detection and correction. This would result in a lack of consistency in error detection and correction procedures as well as additional expense. Others have become involved in analyzing the impact of removing the Reed-Solomon encoding capability (including Adrian Hooke/317). The ensuing general discussion has generated quite a controversy. Where this issue ultimately goes remains to be seen.

Kristan Lattu

Kristan, Dick Grumm/355, and Donald W. Lewis/797 (Drop Physics Module representative) will be attending a series of meetings this week at MSFC in Huntsville (21 to 24 August) including the Spacelab-to-Space Station Transition Study meeting, the Space Station Furnace Facility Conceptual Design Review (CoDR), the Inter-center Systems Engineering Team (ISET) meeting, and the Microgravity Science and Applications Division (MSAD) meeting.

Kristan is in the process of publishing the final results of the Laboratory Support Equipment (LSE) telecons. Her report on radiation dosimeter issues affecting the Space Station will be reviewed during the next LSE telecons, planned for September of this year. Her report addresses a proposed requirement to restore, as an element of LSE, a comprehensive (combination of passive and active) dosimeter system for the Space Station. Apparently program budget cuts last year resulted in the elimination of active dosimeters in the experiment modules on the Station. Currently, passive/active dosimeters are planned only for the habitation modules. Experimenters feel strongly that active dosimeters are necessary for the monitoring of their sensitive experiments and hope to restore the placement of such dosimeters on each module. Differences in materials and configuration between the modules lead to the expectation of differing radiation dose rates. It was also suggested that the dosimeters be made portable so that various areas within each module could be monitored. Codes S and M will review dosimeter issues soon to determine who has funding responsibility for the matter and whether or not active dosimeters should be located in experimenter modules.

Dr. F. Dennis Morrison/JSC and Dr. Gene Benton/University of San Francisco, both respected dosimeter experts, are leading efforts to get comprehensive dosimeter systems for the Space Station modules. They have offered to participate in the next SUM LSE telecon planned for this Fall. Dr. Benton has been invited by the Soviet Union to help with the construction of a dosimeter system for use on the Mir Space Station next year.

Another issue discussed during the LSE telecons was the high cost of the dosimeters and other related tools. Prices quoted for the equipment seemed extremely high and unreasonable.

Lori Paul

Beginning 1 October, the Space Station Team meeting will have a new, permanent location in the 301-169 conference room.

Document sorting continues in the JPL Space Station Library. Due to limited shelf space and catalog processing resources, prioritization of the many documents received by the library has become necessary. Certain outdated documents, or documents of marginal reference value, will be excluded from the library. The remaining documents will be entered into a new library database in the near future. In the short term, Lori has collected together frequently requested documents (such as those mentioned in the minutes) so that loan requests can be filled quickly.

TMIS connectivity efforts continue to continue. Lack of significant progress in this effort makes it necessary to arrange a troubleshooting meeting with Jim Jacobson/372, Rob, Lori, Jerry Olivieri/311 (who is familiar with the TMIS problem from both an historical and technical point of view) and Dr. Marshall "Mickey" Alper/170. Dr. Alper has offered his assistance in solving some of the chronic problems with TMIS.

Primary distribution of the FROST Version 1.0 User's Guide is nearing completion. Feedback on FROST continues to be quite favorable and secondary requests for the user's guide, generated by

an announcement memo and word-of-mouth, are increasing. Al Webb has asked for an additional 20 copies of the guide to fill requests received by JSO.

Upcoming Meetings

August 21: Evolution Working Group meeting at JSC. Paul Henry to attend.

August 22-24: Kristan Lattu, Dick Grumm and Donald Lewis will attend several meetings at MSFC: the Spacelab-to-Space Station Transition Study meeting, the Space Station Furnace Facility Conceptual Design Review (CoDR), the Inter-center Systems Engineering Team (ISET) meeting, and the Microgravity Science and Applications Division (MSAD) meeting.

August 27-28: Semi-annual Space Station Utilization Project Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.

August 29: SUM Director's Review at HQ. Rob Staehle, Hershal Fitzhugh and Bob White to attend.

August TBD: Communications Systems Engineering Panel (CSEP) meeting. Chuck Ivie will attend.

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. There will be numerous JPL speakers and attendees.

September 22: Cal State Long Beach Second Annual

Recent Space Station-related Items from Code P's "Daily News In Brief" (Typos *not* corrected...)

SPACE NEWS -- July 30

"EVALUATIONS FIND STATION CONTRACTORS BELOW PAR" By Andrew Lawler

"NASA has uncovered deficiencies in the performance of three of its major contractor teams responsible for designing and building the space station, according to agency and industry officials. The teams recently received mediocre or low scores in evaluations of their efforts by station managers."

According to Space News, the most pressing concern is with Grumman Corp., Bethpage, N.Y., which serves as support contractor to the space station program office in Reston, Va.

Space News says that a biannual evaluation of Grumman completed in June gave the contractor good marks for its support activities at Reston but much poorer marks for its integration activities.

The newsweekly cites Grumman sources who say the problem stems from NASA's recent reliance on Grumman to perform more integration activities to help make up for a lack of civil service positions at Reston. According to Space News, Grumman recognizes the problems in its contract and has indicated it is working to resolve the difficulties in the systems integration area.

Space News also reports that McDonnell Douglas Corp., the principal contractor for Johnson Space Center's station work and Boeing Aerospace Co., principal contractor for the crew modules, both received low marks but cites responses from both companies indicating they are working to resolve the difficulties.

The story concludes by suggesting that the Grumman difficulty could precipitate a major adjustment in space station management -- perhaps sparking a move to place more integration responsibility at Johnson Space Center. If that happens, Space News suggests the Congress may lose faith in the program.

ASSOCIATED PRESS -- July 31

"SOVIET LAUNCH"

"Two cosmonauts to be launched to the Mir space station will walk in space to conduct repairs on a hatch that has troubled the crew they will replace, Tass said today."

AP reports that the launch of a Soyuz TM-10 capsule will occur at 1:32 p.m. Moscow time from the Baikonur Space Center in Soviet Central Asia and will ferry Lt. Col. Gennady Manakov and engineer Gennady Strekalov up to the Mir.

The wire reports that the current crew of Mir, Anatoly Solovyev and Alexander Balandin, will return to Earth on August 9.

AP reports that the new crew will be the seventh to visit and staff the Mir, which became operational in 1986.

ASSOCIATED PRESS -- August 1

"SOVIET SPACE"

"Two cosmonauts rocketed into space today to replace a two-man crew aboard the orbiting Mir space station, the Tass news agency announced."

AP's Moscow bureau states the Soviet Soyuz TM-10 spacecraft was launched from the Baikonur Space Center at 1:32 p.m. Moscow time and was on schedule and that the crew was expected to dock with the Mir after two days in orbit.

The wire report says the new crew is expected to stay aboard the Soviet space station for 4½ months and that the captain of the new crew, Lt. Col. Gennady Manakov, is a rooky but the engineer, Gennady Strekalov, has been on three previous space missions -- including one aboard the Salyut space station.

AP quotes the Tass report and says the new crew is expected to make at least two spacewalks to further repair the hatch on Mir and will conduct an additional 250 experiments, some of which will be a continuation of experiments which have been conducted by the current Mir crew, who will return to Earth on August 9.

SPACE NEWS -- July 30-August 5

"EUROPE WARY OF STATION MAINTENANCE PROBLEMS"

"European space station officials are reacting cautiously to a NASA finding that the station will require an excessive number of space walks to remain in working order. One official said the NASA figures are unrealistic because they assume every possible worst case scenario will occur."

The newsweekly says a high-level delegation from the European Space Agency will be in Washington this week to discuss the impact of the maintenance report and to go over NASA's 1991 budget prospects and its possible impact on space station schedules.

The paper quotes ESA Columbus project chief Lanfranco Emiliani as saying "everybody agrees there are too many EVA hours and it's now a question of taking measures to reduce the need for them."

WASHINGTON TECHNOLOGY - August 9-August 22

"RETIRED NSF DIRECTOR BLOCH BLASTS 'BIG SCIENCE' PROJECTS" By Gene Koprowski

"Retired National Science Foundation Director Eric Bloch has sharply criticized Capitol Hill for bankrolling billions of dollars in "Big Science" projects -- namely space station Freedom, the superconducting supercollider and the Human Genome Initiative -- which Bloch says were hastily initiated."

The Washington-area science and technology weekly quotes from an interview with Bloch wherein the outgoing director is quoted as saying "we want to do all of them, and as a consequence we do not do any well. There has to be a understanding that there are only X-number of dollars available. Sooner or later we may want to do an SSC, but is it a priority now?"

The paper says Bloch has declared that the space station isn't even a scientific project, quoting him again as saying "it can't be justified on scientific terms."

And, according to the paper, Bloch does not see the Human Genome Project as necessary research and is quoted as stating "in the end it may be important. But we should be careful before we spend large amounts of money."

The outgoing NSF director, according to the story, feels he failed in the area of acquiring sufficient funding for NSF to bankroll needed science and math education projects and says Bloch found it ironic that Congress would buy gigabuck science projects but not fund kilobuck science education efforts.

The paper notes that Bloch does feel he has accomplished a number of positive things during his six years at the helm of NSF including making the agency more active in the area of scientific competitiveness and science infrastructure and science and math education.

WASHINGTON POST -- August 17

"SPACE STATION BACKERS"

"Despite a recent surge in concerns about the technical problems of the proposed Space Station Freedom, 64 senators have signed a letter supporting NASA and urging full funding for the project."

The Post reports that the letter was sent to Sen. Barbara Mikulski (D-Md.) who chairs the Appropriation subcommittee which funds the agency.

The story notes that in the last month, as the controversial project proceeded through its preliminary design phase, station officials learned the design was too heavy, consumes too much power and requires far more maintenance work than anticipated.

The paper also notes that Capitol Hill insiders have been predicting a significant funding cut for the orbital facility, which is being built by the U.S. with Canada, the European Space Agency, and Japan as partners.

AEROSPACE DAILY -- August 20

"WHAT'S AHEAD: NASA'S CONCERN ABOUT TRANSFERRING TECHNOLOGY TO STATION PARTNERS REMAINS UNRESOLVED."

"Still unresolved is the question of technology transfer to the international partners on the Station, the advisory committee is told, with some NASA managers and contractor personnel unsure how far they can go in passing information to their Japanese, European and Canadian counterparts."

LOS ANGELES TIMES -- August 20

"COUNTDOWN FOR NASA" By Lee Dye

"The agency that electrified the world when it put men on the Moon is suffering from the symptoms of old age, and a movement has begun to remake NASA into the tightly focused agency with the singleness of purpose that allowed it to carry out the great achievements of its past."

The LA Times science writer says that NASA has grown unwieldy and is distracted from its primary mission of research and development and that the thinking in Washington is that the best way to reinvigorate the agency is to remove some of its diversions.

The story suggests some of the diversions which could be removed include the shuttle program and a retrenchment from development of a space station.

The article quotes Sen. Albert Gore (D-Tenn.) as saying "it's not as if NASA is the only government agency that has made some blunders. It's just that theirs are so highly visible and we have so much pride in them and expect so much that we're bitterly disappointed when things go wrong."

The story also cites former astronaut Donald (Deke) Slayton professing the current space station design is too grand and quotes him as saying "I would prefer a modular approach."

The reporter notes that NASA now finds itself in a "Catch 22" situation with regard to the space station and says that to go forward may plunge the agency into a technological abyss but to retrench and redesign or downsize the station would be to waste billions of dollars already committed to the current design and would further undermine confidence in the agency.

The story speculates that what is likely to emerge from the current examination into the structure and future of the space agency is a recommendation for a vastly different kind of agency -- one perhaps stripped of some showcase programs that will be reassigned to new institutions. The paper further suggests that President Bush himself is leaning in that direction and that he only backed away from launching a major, outside, investigation of the agency because of extremely strong opposition from NASA's leadership.

The writer cites interviews with former administrator James Beggs, with Space Policy Institute director James Logsdon, and others and contends that a number of former NASA insiders and a large number of outsiders believe the problem lies with the age of NASA's management and the multiple center/contractor management style being invoked on projects such as the Hubble telescope and the space station.

The story rambles on for over 10,000 words and finally concludes that the only thing likely to change is NASA.



National Aeronautics and
Space Administration

Washington, D.C.
20546

AUG 8 1990

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Reply to Attn of:

TO: M/Associate Administrator for Space Flight

FROM: S/Associate Administrator for Space Science and
Applications

SUBJECT: Office of Space Science and Applications Guidelines
for the Development of Station Payloads

Space Station Freedom (SSF) utilization is an important element in the Office of Space Science and Applications (OSSA) strategic plan, and we are currently preparing an aggressive space science flight program to exploit the unique capabilities of SSF. During the mid-to-late 1970's, however, when OSSA concurrently developed scientific payloads in parallel with NASA's development of Shuttle and Spacelab Systems, the results were less than desirable. Spacelab and Shuttle experiment accommodations and interfaces were initially not well defined and underwent frequent design changes, especially in the areas of data management, power, structures, and software systems. These frequent changes resulted in numerous modification and/or redesign of flight and ground hardware/software with associated impact to OSSA costs and payload schedules.

Cognizant to the lessons learned in preparation for the Spacelab era, and in order to ensure continued OSSA success in preparing for the Space Station Freedom era, I have established the following programmatic guidelines relating to OSSA hardware development and utilization for the Space Station:

1. OSSA will provide full and early man-tended utilization of the SSF by developing accommodation equipment to adapt Spacelab flight hardware of continuing significant interest to the U.S. science community to operate with SSF systems. We anticipate that we will have adequate Spacelab hardware for any conceivable early use of SSF.

2. The OSSA Space Station unique hardware will be developed using a sequence of concept studies (phase A); preliminary definition (phase B); detailed design, development, and testing (phase C/D); and science verification. Phase C/D development for OSSA Station-unique hardware will begin only when:

- a. Competitive phase B studies have been completed;

b. Science definition has been established by principal investigators selected through OSSA Announcements of Opportunity (AO's), NASA Research Announcements (NRA's), or alternatively by established facility science working groups; and

c. SSF interfaces and operational parameters have been defined to a level consistent with a completed SSF program level Critical Design Review (CDR).

3. Although we will seek rapid response science opportunities for smaller programs, we will not artificially constrain major hardware development efforts to unrealistically short development periods. OSSA payload element developers nominally will be provided up to 5 years to complete phase C/D detailed design and development, to perform science verification testing, and to ship flight hardware to Kennedy Space Center for payload processing. Naturally, payloads that would be developed rationally on a shorter time scale could have a reduced development cycle provided that the availability of SSF accommodations can be assured.

The OSSA Traffic Model which was released on June 8, 1990, is currently being revised to reflect these OSSA guidelines as well as the 90-2 budgets. A draft copy will be made available to your staff at the earliest opportunity.



L. A. Fisk

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

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Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Lewis, Donald W.	797	183-801	4-0840		

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Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maud, Don	311	2158 LaJolla Dr, Stockton, CA 95204			MHumfreville
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JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-585

10 September 1990

TO: Distribution

FROM: Lori Paul 

SUBJECT: SS Team Minutes for 10 September 1990

PRESENT: Rob Staehle, Govind Deshpande, Dick Grumm, Cate Heneghan, Paul Henry, Hershal Fitzhugh, Dennis Kern, Kristan Lattu, Sima Lisman, Tom Luchik, Gerry Murphy, Lori L. Paul

Next Meeting: 17 September 1990 at 10:30 in 301-427

Notice: We are pleased to announce that a permanent conference room has been obtained for Space Station Team meetings. Beginning 24 September, Monday meetings will be held in 301-169.

Rob Staehle

Due to the extended length of today's meeting, Cate Heneghan's presentation on the topic of advanced robotics for in-space vehicle processing has been postponed until the 17 September meeting. Cate will discuss crew/robot/automation tradeoffs and explore ways to reduce EVA time on the Station.

Rob addressed concerns that some sort of NASA furlough, planned for this Fall, will affect JPL employees. Though a furlough is possible, it does not seem probable at this time. There is a legal requirement that advance notice of 22 work days must be given to NASA employees before a furlough may take place. The NASA Administrator has sent a letter to all NASA employees giving them such notice and stating that a furlough is possible after 1 October of this year. Though a furlough may legally last as long as a month, a one day furlough seems most probable if one is to occur. The Space Station Program is currently prepared for a one day furlough on 12 October 1990 (Columbus Day). JPL policy does not recognize furloughs. JPL has an implied contract with its employees that as long as funds exist its employees will continue to work. Therefore, there will be no furlough for JPL employees. If, however, JPL exhausts Space Station task funds, employees working on those tasks would be forced into "090" lay-off status. This is a JPL-wide problem, not isolated to Space Station, if the NASA budget is sequestered.

Robert Moorehead/MS has asked all Level II divisions to reduce non-essential expenses (travel that is not in support of PDR, most software acquisitions, hardware procurements, etc.) Though this request was not made directly to JPL, we will also honor the directive to reduce spending. Until 15 November, all Space Station travel by JPL/Pasadena personnel will require Rob's approval. Please get travel requests to him as soon as possible (as soon as travel needs arise).

Rob reported on the recent OSSA review that he and Hershal Fitzhugh attended. Two reviews were actually combined into one: the Semi-Annual Space Station Utilization Review and the Science Utilization Management Director's Review (SUM-DR). Fitz made presentations at both reviews, which were well received.

The reviews generated several serious concerns:

1. Redundancy in resources which support payloads is necessary, particularly for electrical power on the Station. As a cost saving measure, Moorehead is reported to have stated that payload support will be "zero fault tolerant." (In other words, if power on the Station is

interrupted or fails completely, there will be no backup system for payloads.) This assertion has serious implications for both the safe operation of experiments and the Station itself. Also, if each module or experiment must provide its own emergency power source, the cost of the Space Station might actually increase, rather than decrease. The basic problem is: how does a payload safely shut down when power, communications, data, etc. are interrupted?

2. Contrary to our best efforts to unify the process for Space Station payloads, there seems to be emerging two parallel payload safety processes, one track for the STS and one for the Station. The "Payload Safety Requirements" SSP 30xxx document from the Level II safety office was distributed at the last UDAWG meeting, which no JPL/Pasadena staff attended. Remer Prince/MUU has a copy of the document. Bob White/794 is to offer JPL assistance, probably in the person of Valerie Thomas/521.
3. Ben Farley/MSFC gave a presentation regarding the data management subsystem at the review. He stated that he would soon visit all the NASA centers to discuss the DMS requirements of their payloads. Strong opposition was expressed at the review to the schedule of his visits. Farley said then that he plans to be at JPL on 21 September. This may now be the same meeting which had formerly been scheduled to take place at JPL with Carol McLemore/MSFC on 24 September. Dick Grumm plans to attend the meeting. Those with questions or an interest in the meeting should contact Dick at 4-9267 or Ben Farley directly at (205) 544-1952 or FTS 824-1952.

Rob presented the SUM PDR RID Count (See copy of viewgraph attached to the minutes). 782 RIDs were submitted by the SUM team. Approximately 21,000 RIDs have been submitted over all the work packages. (Work Package 2 Data Management Reviews account for approximately 9,000 of the total.)

The SUM team wrote four Change Requests (CRs) addressing the following issues:

1. There is insufficient power for Space Station users.
2. For the Canadian Space Agency, there are insufficient power resources for payloads on the Mobile Servicing Center (MSC) during the MSC translation process. Power absorbed by the translation process apparently leaves no power available for other purposes.
3. Problems with metric versus standard (inches) measurement systems for Space Station tools and equipment need to be resolved.
4. Internal temperature control system customer loop redundancy should be provided in the U.S. Lab module. There is currently a zero fault tolerant thermal control system loop planned for the Lab. The lack of redundancy in the thermal control system could generate safety hazards and jeopardize experiments (including the lives of lab animals and plants).
5. There is a need for user air-to-water heat exchangers. Air cooling is inadequate in current Station design.
6. Users should have access to the U.S. Lab 5 degree celsius and 20 degree celsius cooling loop interface connectors on the utility interface panel. As currently planned, only one set of connectors is available. This means that users have access to only one temperature loop. Some life science experiments apparently require access to both temperature loops.
7. The SSF Program states that a 75 kilowatt output will be provided at the Station solar arrays; users must accept all the losses of power between the arrays and their equipment. However, the users have assumed that they must accept a loss in the stated amount of power only after the DC to DC converter (after the rack). This difference of interpretation must be resolved.

At the Semi-Annual Space Station Utilization Review, MSFC representatives expressed the opinion that MSFC has been assigned the responsibility for integration and operation of all OSSA Space Station payloads. This assertion generated quite a bit of controversy and heated discussion.

There was a statement made by Earl Teidt/NASA Headquarters that the SSF DMS was to be zero fault tolerant. An OSSA white paper on the DMS is in progress. Chuck Ivie/366 and others may wish to obtain a draft.

Small and Rapid Response (SARR) payloads have been renamed Small Rapid Response (SRR) payloads (the "and" has been dropped). JSC has established a project office which is conducting a project definition study activity in accordance with NASA Management Instructions 7120.3. The study will study how to set up a project. (See the SRR viewgraph "Strawman Resource/Engineering Envelopes" attached to the minutes.)

Rob will ask Ray Starsman/JSO and Bob Glass/JSO by this memo to send Hershal Fitzhugh/374 all the CRs which impact users. The SUM Team may find information in the CRs useful. Fitz is our official SUM team member.

Phil Cressy/SM is of the opinion that centralized instrument operations and integration is more economical than distributed instrument operations integration. For this reason, he has not been supportive of distributed capabilities. Rob suggested that documentation from some project (for example, Mars Observer planning) might be used to convince him otherwise. Dick Grumm responded that a definition of what is meant by "economical" must be made before an evaluation of centralized versus distributed operations integration can be made. What is economical often represents that which is cheapest in total cost, regardless of how much (or how little) science can be accomplished. What is economical should be defined by the dollar cost per unit of science. In other words, what is the cheapest price we can pay per "pound" of science?

Rob gave Gerry Murphy a new CR, "Storage of Hazardous Chemicals" (CR #BJ020396-A), for evaluation. Comments from Gerry and Fitz are due to Bob Glass/JSO by 17 September.

OSSA is in the process of producing their annual "report card" for JPL. The assessment will be more formal than in the past. JPL managers for pass-through tasks are asked to submit a brief (two or three sentence) summary of their accomplishments during this year to Rob by 3:00 pm on 12 September (Wednesday). Please FAX or hand deliver the summaries, do not rely on JPL mail. These inputs will be provided to Bob Easter/JSO, who is preparing the JPL Space Station input.

From Dick Laeser's JSO weekly report: At the 14 August Resources Control Board, the Deputy Director approved deletion of the redundancy in the 300 megabyte per second, Ku-band Tracking and Data Relay Satellite communications equipment. The remaining string of equipment is now zero fault tolerant. This change is predicated upon upgrading the Station's redundant S-band communications capability from the baseline 3/16 kilobits per second (KBPS) uplink/downlink to rates of approximately 72/192 KBPS uplink/downlink. This change, along with the deletion of ancillary antenna support structures, results in a weight savings of approximately 2,063 pounds. Also, a simplification in the design of the Global Positioning System receiver equipment allows reduction of an additional 104 pounds.

JSO is hosting the initial meeting of the Communications System Engineering Panel 24-25 September. The meeting will be devoted to a review of the draft revisions to Section 7 of the Space Station Information System Definition and Requirements Document. Chuck Ivie will attend.

At the direction of the Deputy Director, JSO is coordinating a meeting in Reston on 18 September to present various options for achieving Station-wide commonality of video subsystem hardware. Proposals will be presented by Work Package managers and/or their contractors. An executive session will follow between the Deputy Director and Work Package managers to resolve outstanding issues.

Rob received an urgent memo from OSSA which reminds all JPL Space Station Team members that "under no circumstances should [the Jet Propulsion Laboratory purchase] Government property for use by NASA employees." It is illegal for NASA to have contractors, including JPL, provide any equipment, software, etc. for use by NASA government employees. NASA employees must obtain their equipment through the Headquarters Contracts and Grants Division or Small Purchasing Branch. (Of course, this prohibition does not apply to JPL/Pasadena procurements for JSO staff because they are JPL employees.)

Govind Deshpande

The FROST Analysis and Study Team (FAST) is in the process of publishing its second case study, "Analysis of NIU Bandwidths." Final comments on the document from FROST Development Team members are due by 13 September. Delivery of the study to Al Webb/JSO is expected by 20 September.

SDTM 2.0 is being tested with the full-up Space Station design. Testing is being conducted by George Fox/311 and Will Duquette/311 and is proceeding as planned.

A video conference between JPL and JSO to discuss SDTM applications and maintenance has been scheduled for 11:30 am PST on 20 September in the JPL video facility in Bldg. 230.

Paul Henry

Paul attended the Evolution Working Group meeting at JSC on 21 August. The following issues were covered:

Turbo Team activity was a topic of interest.

The elimination of two truss bays outside of the alpha joint on the Space Station to reduce material weight was discussed at length. Elimination of the bays would result in solar panels being located closer to the center of the Station. This new configuration would present serious field of view problems for attached payloads.

Housekeeping for the lab module will require 15 kilowatts of power, with total capability limited to 25 kilowatts.

There was concern over the number of roll rings at the alpha joint because of the impact that number would have on the maximum current on any Station circuit. There is a limitation of 134 amps on any circuit with 24 alpha joint roll rings.

Comments on the Level I Utilization Plan have just been received from Barry Epstein/MUU. Paul will be discussing the plan with him further.

Thomas Luchik

Thomas Luchik/354 is seeking information from the JPL Space Station Team which will assist in the establishment of a Low Temperature Research Facility, which could fly on the Space Station (the project has been initiated by Code SN). He is interested in what sort of resources and capabilities the Space Station will have for the power and communication needs of this new project. He also needs to know what sort of mechanical interfaces are available on the Station. Paul Henry and others will attempt to provide some information to him.

Sima Lisman

Sima made a successful presentation about the Disturbance Simulation and Management Tool (DSMT) at the September AIAA Conference in Pasadena. GE Astro and others have requested Beta versions of DSMT as result of the conference and her various demonstrations.

Final comments are due tonight (10 September) for the DSMT program description document. Final delivery of the document is expected soon. Unless funding problems are eliminated, Sima will be leaving the Space Station Team in 2 to 3 weeks. Her replacement has not been selected, and will not be until funds are made available.

Lori L. Paul

JPL has obtained TMIS connectivity. (!) Accolades are due to Jim Jacobson/372 of JPL's Communications, Computing and Network Services Section for his perseverance above and beyond the call of duty. The TMIS Service Request submitted by Hank Beck has been officially signed off. Now that basic network connectivity has been achieved, functional access to TMIS will be attempted on both 32 bit workstations (SUN or APOLLO systems) and IBM PC-class computers. If TMIS can be utilized on these systems, Boeing TMIS classes will be arranged for those interested. (Note: a meeting was held on Tuesday, 11 September to celebrate TMIS connectivity and develop action items for applying TMIS where it will be most useful.)

Upcoming Meetings

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. There will be numerous JPL speakers and attendees.

September 18: Station video subsystem commonality session in Reston. No one yet slated to attend.

September 20: Videoconference (in bldg 230) with JSO on SDTM applications and maintenance.

September 22: Cal State Long Beach Second Annual Space Conference. Rob Staehle to attend.

September 24-25: Communications System Engineering Panel meeting in Reston. Chuck Ivie to attend.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

SPACE NEWS -- 8/27-9/2

"JAPAN PLANS LUNAR BASE STUDY" By Andrew Lawler

"Japan next year intends to take a large, though somewhat symbolic, stride toward establishing a future inhabited base on the moon by funding early work aimed at planning for such a mission and other human exploration of the planets."

Space News reports that the National Space Development Agency (NASDA) recently asked the government for \$2 million to study human lunar and planetary missions.

The report says the study money may be indicative of a go-ahead for a full-fledged program later this decade and that the focus of the study is the moon and not Mars or other planets.

STRAWMAN RESOURCE/ENGINEERING ENVELOPES

CATEGORY	SRR(A)	SRR(P)
Mass	300kg**	75 lbs max. per P/L
Volume	0.5 m ³	3.6 ft ³ max. per P/L
Power	300 w Max	1.5 kwh Max
Thermal Interface	Passive	Air cooled
Mechanical Interface	Standard	Standard
Data	2 Mbps(downlink rate)	20 kbs serial
Command	≤10 kbs	10 kbs serial
EPS/DMS Interface	TBD	TBD
Contamination Hazards	Self Contained	Self Contained
Crew Time	Minimal*	Minimal*
Pre/Post Flight Activities	None	None
Length of On-orbit Stay	3-18 months	3-12 months
Special On-orbit Accommodations	TBD	TBD
Servicing Requirements	TBD	TBD
Pointing	If required. provided by sponsor	If required. provided by sponsor
Attitude	Not real time	Not real time

** Includes payload and all accommodation hardware

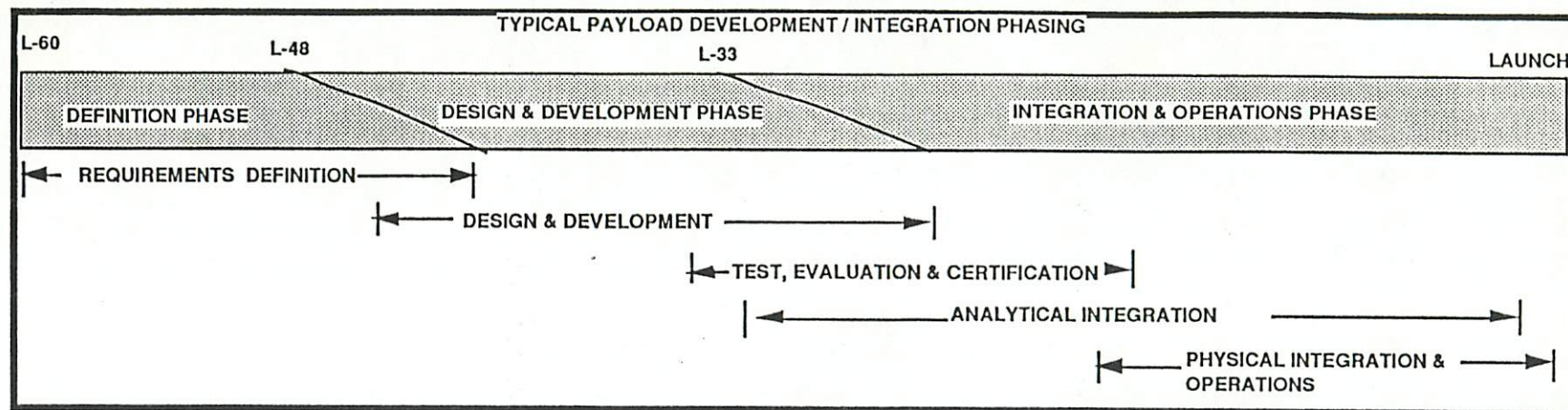
* No special crew training required

90/8/27

55 team minutes

-Feb 31/19

TYPICAL PAYLOAD DEVELOPMENT/ INTEGRATION IMPACTS



DEFINITION

- Payload Classification (Class A or B)
- Resource Requirements / Engineering Envelopes
- Non-standard STS / SSF Interface Requirements
- AO Selection Process
- PDRD Changes
- Procurement Process
 - Make/Buy Decisions
 - Pre-Award Surveys / Audits
 - Proposal Assessments

DESIGN & DEVELOPMENT

- Major Milestone Reviews (PRR, CDR, AR etc.)
- Safety Review Process
- Programmatic Documentation Requirements
- Trade/Technology vs Baseline Requirements
- Institutional Requirements
- RID Teams, Board, resolution / Closeouts
- Configuration/Fabrication Control
- Parts Rating / Procurements

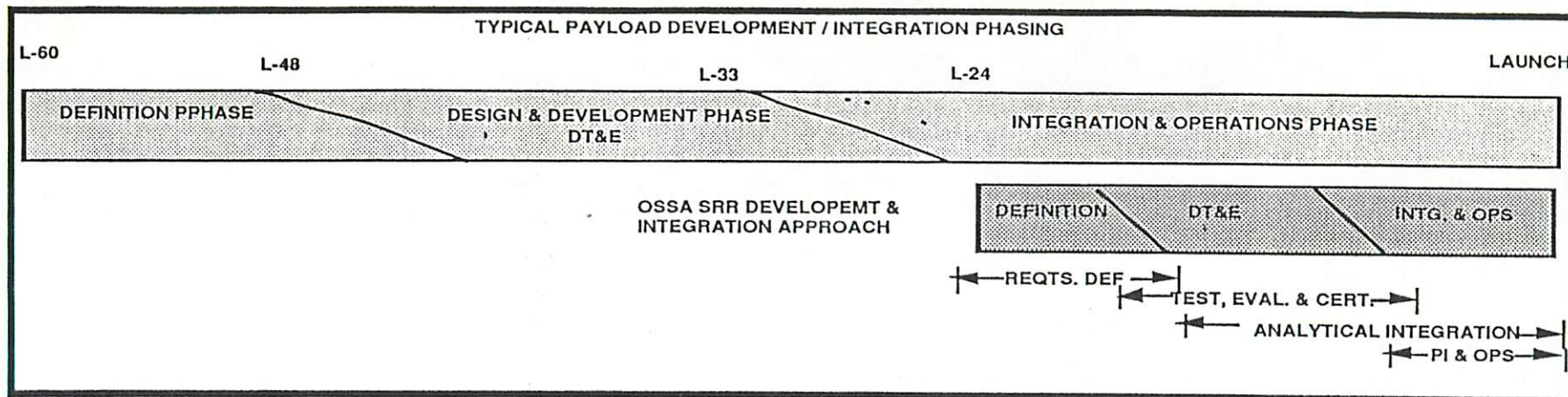
TEST, EVALUATION & CERTIFICATION

- Hardware Acceptance and Certification process
 - Types and Number Of Test
 - Hardware Retest
- Facility Availability & Utilization (Facility Downtimes)
- Configuration Control / Evaluation Process (Redesign, Delta-Reviews)
- Hardware Nonconformances and Failures
 - Problem Reporting, analysis'
 - Corrective Action, Recurrence Control
- Troubleshooting, Rework, & Repair
- Documentation Revisions, Review, Routing, Approval
- Discipline Support (SRM&QA, Technical Services, etc.)

INTEGRATION / OPERATIONS

- Analytical Integration Process (Documentation, Assessments, Interfaces Coordination)
- PIP / FIP Process
- Physical Integration Process
- Integration Levels (Interface vs ground engineering carriers)
- Centralized vs Distributed Integration
- KSC Facility Access
- Hardware Malfunctions, & Failures
- Payload Developers Resl-time Support
- Safety Analysis & Panel Disposition
- PAD Operations (Early/Late access)
- Crew Interface / Training Requirements
- Pre-Post - flight Operations

OSSA'S APPROACH TO MINIMIZING EXISTING PAYLOAD DEVELOPMENT PROCESS



DEFINITION

- Minimal STS/SSF Interface Requirements
- Predetermined SRR Resource Limits
- Pre-determined SRR Selection Process
- Payloads Classification (C or D)
- Procurement Process
- Off-the-shelf
- Reflown Hardware
- Minimal Development (Inhouse)

DESIGN & DEVELOPMENT

- One Technical Design Review That Encompasses Requirements of PRR, PDR, & CDR
- Minimize Safety Review / Panel Disposition Process
 - Self-Contained hardware
- Commercial Off-the-shelf Parts
- As Built Assembly Level Inspection Only
- PRD Combined Test Plans/procedures

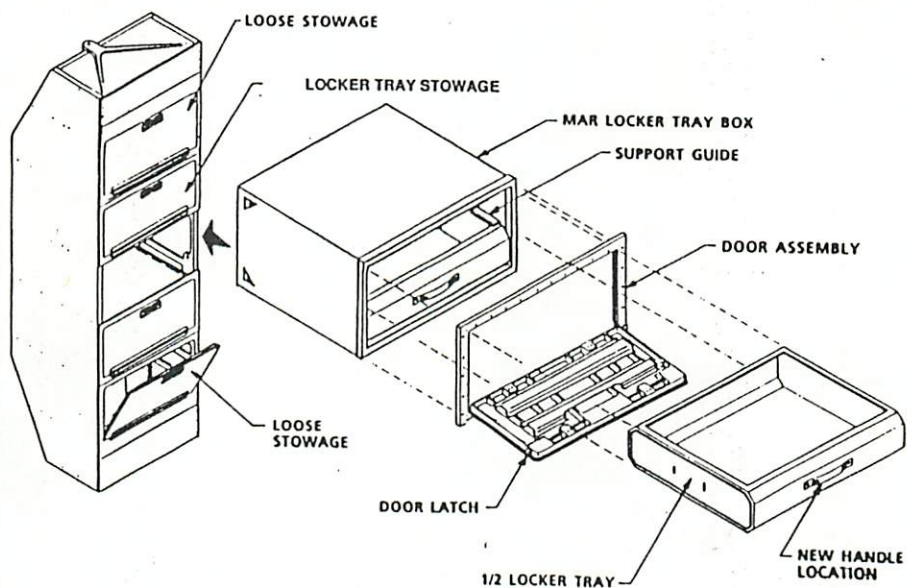
TEST / INSPECTION & EVALUATION

- Utilize Manufacturer specification /test data
- Perform only environmental testing if required
- Utilize existing OSSA provided facilities
- Develop standard nonconformance system for problems/failures
- Minimize documentation requirements

INTEGRATION/OPERATIONS

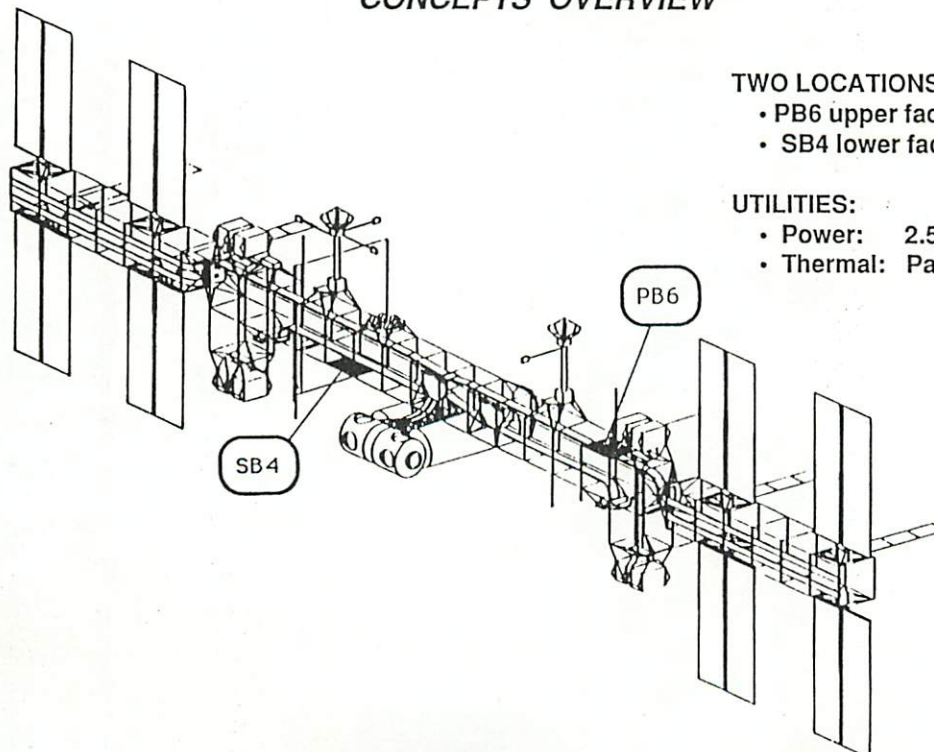
- Utilize OSSA flight qualified carriers/ accommodation equipment
- One Standard SRR PIP/FIP Document
- Conduct Ground Integration activities at OSSA centralized PIC at KSC
- Define on dock requirements for KSC PIC acceptance
- Minimal crew interface / training
- No PAD operations
- No Pre/Postflight baseline data collection requirements
- Minimal final interface testing
- Single Phase Safety Review

SRR (P) PAYLOAD ACCOMMODATION EQUIPMENT CONCEPTS OVERVIEW



29

SRR (A) PAYLOAD ACCOMMODATION EQUIPMENT CONCEPTS OVERVIEW



TWO LOCATIONS FOR SRR (A):

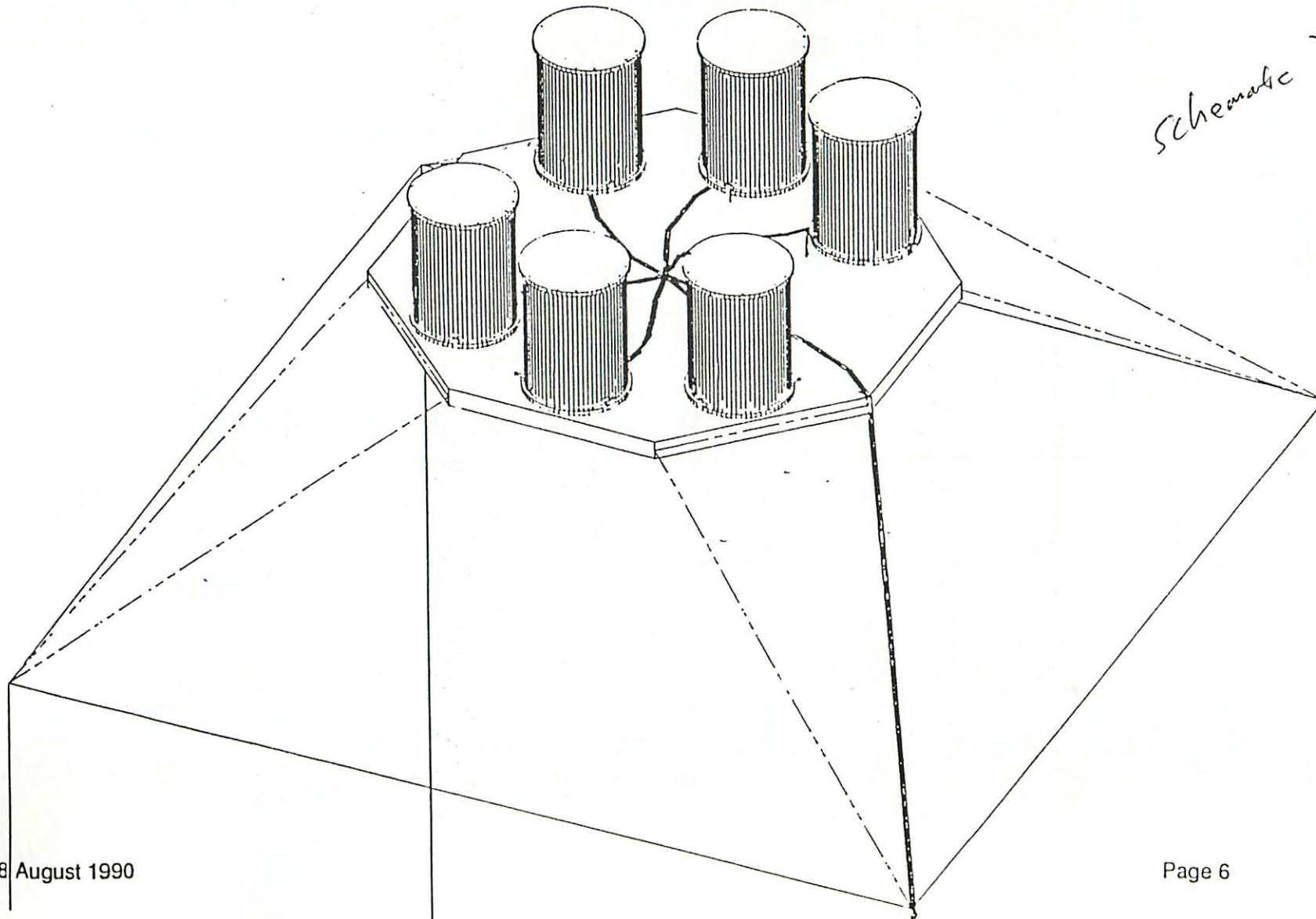
- PB6 upper face
- SB4 lower face

UTILITIES:

- Power: 2.5 kw
- Thermal: Passive

24

SRR ATTACHED PAYLOADS WILL BE ATTACHED TO TRUSS ELEMENT BY THEIR OWN UNIQUE ADAPTER



SUM PDR RID COUNT

closed on 8/24

only picking most important RSD issues & entering into CRs

PDR	NUMBER OF RIDS	NUMBER OF CRs*	AMOUNT OF PAPER REVIEWED
WP01	243 51	3	19 BOXES
PHASE I	51	3	11 BOXES
PHASE II	192 <i>+ SBH coming in</i>	-	8 BOXES
WP02	490	-	61 58 BOXES
TCS	3	-	2 BOXES
EVA	9	-	1 BOX
C&T	39	-	7 BOXES
GN&C	20	-	6 BOXES
IPR (Ø1/Ø2)	77	-	23 BOXES
DMS1	18	-	8 BOXES
DMS2	30	-	5 BOXES
DMS3	294	-	5 BOXES
WP04	18	1	2 DOCUMENTS
CSA	31	-	4 BOXES
GRAND TOTAL	782	4	81 BOXES

* TO DATE

submitted by SUM

didn't need every page - picked where the most need was.

status not back from SSF on these RSDs

SUM PROGRAM REVIEW

5:41 PM

26m 8/24/90

Tab 2 / PAGE 24

SUM

of 9000 rides on data system, SSF shows that all but 32 discontinued (as opposed to closed)

how are others

WP-2R ID closed not considered an internal SSF matter, and not fed back to originator after reporting disposition. i.e., study results not reported back to originator after OIRA. WP-02 working better

21,000 RSDs written on WP-2

PRELIMINARY DESIGN REVIEW (PDR) SUPPORT

WP01 PDR: SIGNIFICANT ISSUES*

see CRs coming out of there, & 2 pages

- PROVIDE 5 °C COOLING LOOP CAPABILITY TO BOTH THE PORT AND STARBOARD SIDES OF THE LAB AND PROVIDE ULTRAPURE WATER ACCOMMODATIONS TO THESE RACKS
- PROVIDE OPTIONAL AIR-TO-WATER (CONDENSING) HEAT EXCHANGER ON A RACK-LEVEL SCALE, OR INCREASE AVIONICS AIR CAPABILITIES
- PROVIDE 5 °C COOLING LOOP PROVISIONS IN NODES
- PROVIDE BOTH 5 °C AND 20 °C COOLING LOOP INTERFACE CONNECTORS ON RACK UTILITY INTERFACE PANELS FOR SPECIFIED USERS
- PROVIDE A REDUNDANT COOLING PUMP PACKAGE IN THE USL CUSTOMER LOOP
- PROVIDE ACCESS TO A CONTINGENCY SUPPLY OF COOLANT IF RESUPPLY SKIPS A CYCLE
- *Boeing says TCS coolant not considered a consumable resource. No recovery adapter*
MODIFY HAB TCS SPEC. OR DESIGN SO THAT IT CAN MAINTAIN A MINIMUM COOLANT TEMPERATURE (35 °F) AT AN OPERATING TEMPERATURE OF -40 °F - *Boeing says too severe.*
- *internal video sys*
PROVIDE IVS INTERFACE VERIFICATION AND TESTING WITH C&T CMS *control + monitoring sys*
- *internal video data sys*
PROVIDE COMMAND HIERARCHY FOR EFFECTS OF IVDS CONTROL SOFTWARE ON COMMAND/CONTROL OF VIDEO ORU'S AND PROVIDE FOR DIRECT INTERFACE WITH CMS LOCAL BUS *commands sent over 1553 bus*
- PROVIDE VIDEO MONITORS IN NODES
- INCLUDE PMC ECLSS DESIGN LOADS IN ECLSS REQUIREMENTS FOR THE ACCOMMODATION OF LABORATORY ANIMALS (PMC)
- RACK PIVOT ASSEMBLY ACTS AS LOAD PATH BETWEEN STAND-OFF AND RACK *standoffs used on ground loading; not possible to carry launch loads. must be removed before launch/stowage, then re-installed once in orbit.*
- RACK LOWER ATTACHMENT ASSEMBLY HAS AN INTERFACE INCONSISTENCY

* FROM PHASE I PDR; PHASE II PDR IN PROGRESS

WP04 PDR: SIGNIFICANT ISSUES

- INSUFFICIENT POWER TO SSF USERS (PAYLOAD AND SYSTEM)
 - WP04 PDRD INTERPRETATION IS THAT 75 KW IS PROVIDED BY THE PV MODULES; ALL POWER LOSSES BETWEEN THE PV AND THE USER INTERFACE IN THE USL ARE CHARGED AGAINST USER ALLOCATIONS *I understand, instead, power is @ DDCU*
 - EPS CAN BE UPGRADED TO PROVIDE AS MUCH AS 175 KW, HOWEVER, EPS INFRA-STRUCTURE TO SSF ELEMENTS DOES NOT SUPPORT FUTURE EXPANSION
e.g. cable routing along track, i.e. long wire cable delay

CSA PDR: SIGNIFICANT ISSUES

- LACK OF RESOURCES DURING MSC TRANSLATION (POWER/DATA) *all power avail to MSC is required to move data, i.e. 0 power to all other routing*
- USERS ORU/TOOL STORAGE ON MSC OR MMD *MSC requires dedicated storage*
- SPDM AND FTS COMPATIBILITY (DO NOT WANT 2 DIFFERENT INTERFACES) *SPDM/FTS have 2 end effectors - SPDM has no end effectors, only a tool changer unit*
- METRIC/ENGLISH TOOLS

SUM INITIATED CHANGE REQUESTS IN RESPONSE TO PDR

- IN ORDER TO PURSUE IMPORTANT USER ISSUES BEYOND PDR, SUM HAS INITIATED LEVEL II CHANGE REQUESTS ON SIGNIFICANT PDR ISSUES

WP01

M90-0001

PROVIDE USL ITCS CUSTOMER LOOP FUNCTIONAL REDUNDANCY

- ZERO-FAILURE TOLERANT TCS LOOP
- SCIENCE PRODUCTS COMPROMISED WITH LOSS OF COOLING
- PLANT AND ANIMAL SURVIVAL UNLIKELY

intermed temp. control reqs
- Science related impact

M90-0002

PROVIDE USER AIR-TO-WATER HEAT EXCHANGERS

- INADEQUATE RACK-LEVEL TEMPERATURE AND HUMIDITY CONTROL
- AVIONICS AIR COOLING CAPABILITY OF 200 WATTS PER RACK, 600 WATTS PER RACK NEEDED
- MUST DISSIPATE HEAT THROUGH THE AVIONICS AIR AND INTO THE TCS LOOP

*if all racks turned on, 1.5 kW/rack max
air cooling will need to increase, better use
of TCS, but avionics air enters air externally
only for heat, even though → \$*

M90-0003

PROVIDE USER ACCESS TO USL 5° C AND 20° C COOLANT LOOPS

- life req. req.*
some avionics require for both loops
- ONLY ONE SET OF CONNECTORS AVAILABLE ON UTILITY INTERFACE PANEL
 - 9 OF 10 RACK POSITIONS WITH LOW-TEMPERATURE COOLING ARE ON THE PORT SIDE

WP04

TBD


PROVIDE 75 KW AT THE COMBINED OUTPUT OF ALL SSF DDCU's TO USERS

- SSF SHOULD COVER ALL POWER LOSSES TO GET 75 KW TO THE USER INTERFACE

311.4-588

17 September 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: SS Team Minutes for 17 September 1990

PRESENT: Rob Staehle, Randy Cassingham, David Werntz, Hershal Fitzhugh, Sima Lisman, Richard Grumm, Chuck Ivie, Paul Henry, Govind Deshpande, Kristan Lattu

Next Meeting: 24 September 1990 at 10:30 in 301-169

Notice: A permanent conference room has been obtained for Space Station Team meetings. Beginning next Monday, regular meetings will be held in 301-169.

Rob Staehle

Rob talked with Bob Easter this morning -- no new hard news on next year's funding. As expected, the Space Station budget was cut substantially in the Senate committee. Cut funding may be restored by the full Senate. "Stay tuned."

OSSI fiscal 1991 SRMs are due September 21 to Wayne Eklund. Guidelines for Reston tasks have not been issued yet. There has been a problem in the past with outside contractors (including the houses for contract employees) not billing in a timely manner. Some charges have come in months after an account has been closed. All outside contractors are to be told by task managers that any bills submitted more than 60 days after work is performed may not be paid.


As announced last week, JPL now has TMIS access. Anyone with potential uses for TMIS should convey their needs to Lori Paul by Wednesday. Lori has a summary of TMIS capabilities if you would like to see what they are (the summary was handed out to those present at the meeting).

FAST, the Freedom Assembly Sequencing Team, has completed the software release for this effort. They are currently working on documentation for this VAX-based resource allocation and planning tool and will deliver the package to JSO this month. The Utilization and Operations branch of the Program Office has indicated their interest in FAST's possible application to Assembly Complete logistics planning. Mark Bergam/JSO is coordinating between U&O and the FAST personnel. The FAST software may also be used to support a LaRC effort, "Tool for Operations Modelling and Analysis in Space" (TOMAS). Negotiation of a statement of work with LaRC is in progress. Funding for this job is at JPL and will be released when a work statement is agreed upon.

Remer Prince/MUU has asked for monthly progress reports on MUU-funding tasks. The reports will consist of a brief description of progress made the previous month and the funds spent to make that progress. Randy Cassingham will coordinate the inputs; the first report is being sent today.

Thanks to all who provided the requested input being compiled by Bob Easter for the annual JPL "report card". All inputs were provided before the deadline.

The August issue of "Station Break", the Code M-sponsored newsletter, had some interesting charts on the Station's weight and power envelopes. A copy of the pertinent page is attached. Randy Cassingham will try to find out why we have not been getting copies of this newsletter for the past several months.



Again, due to current travel restrictions, anyone with a need to travel anytime soon should coordinate as soon as possible with Rob. Until 15 November, all Space Station travel by JPL/Pasadena personnel will require Rob's approval.

Senator John Glenn, a member of the Columbus 500 Space Sail Cup Steering Committee, announced Friday that the World Space Foundation Team (which includes JPL) had been chosen to represent the US in the solar sail "race" to Mars starting in 1992.

Govind Deshpande

The draft documentation for SDTM 2.0 is in progress and on schedule. FROST is still active and supporting Allen Webb. FROST's NIU bandwidth study, which was due September 20, was delivered today. Videocons with JSO regarding both efforts are scheduled in the next few weeks to discuss future options. The SDTM videocon scheduled for 9/20 has been postponed to 9/27 at 1:30 p.m. The FROST videocon is scheduled for 10/5. FROST and SDTM both lack carry-over funds.

Paul Henry

Paul will deliver the final draft of the near-term version of the Level I Utilization Plan to Code MUU on Thursday. Effort will now focus on the long-term plan. The task should be completed by the end of October, and Paul is discussing further work with Barry Epstein/MUU. Progress has been slowed as a result of Remer Prince's unavailability to review intermediate drafts.

Chuck Ivie

MSU was ordered to look again at High Rate Data issues. Angie Johnson/MSU suggested to Moorehead that JPL be tasked to work on this issue as we have expertise in this area. Chuck will be following up on this. In the meantime, he is still working on Section 7 of the PDRD, adding policy and justification language to his inputs.

Dick Grumm

Code SN has requested further input on the E-SUMITS data base from Dick, especially in the area of the DMS. The DMS is the current hot topic in many circles right now. Dick feels they are making good progress estimating actual data management requirements, rather than making out-and-out guesses. DMS requirements were to be updated at the upcoming UDAWG meeting, but that meeting has apparently been indefinitely postponed.

Sima Lisman

This is Sima's last week on Space Station. A replacement has not been found yet. She will be finishing the Program Description Document and the requirements memo on her Disturbance Simulation and Management Tool this week. Bob Laskin will continue to work with Gerry Murphy, who is in turn seeking continued support for Kevin Schaefer/MSU.

Hershal Fitzhugh

It was announced some time back that Carole McLemore/SUMS was to travel to all the NASA Centers to discuss DMS requirements, but this has been indefinitely postponed.

As part of his SUM functions, Judee Robey/Bionetics for Code S asked Fitz to review the Space Station version of the *Mission Requirements on Payloads/Facilities/Experiments* document, which is titled *WP-01 Space Station Freedom Program SS-HDBK-0002: Guide, Space Station WP-01 Payload Users Draft One* (dated August 3, 1990), which he has completed. Now, she has asked that he present it to a planner's meeting (made up of planners from the various discipline offices) at Headquarters.

Upcoming Meetings

September 17-19: AIAA/NASA Second International Symposium on Space Information Systems at the Pasadena Hilton. There will be numerous JPL speakers and attendees.

September 20: Videoconference (in bldg 230) with JSO on SDTM applications and maintenance.

September 20-28: International Standards Workshop for Centers for the Commercial Development of Space (CCDSs) at JPL.

September 21: Station video subsystem commonality session in Reston. No one yet slated to attend.

September 24-25: Radio Standard Committee of the International Standards Organization (ISO) meeting at JPL (167-Conference room).

September TBD: Communications System Engineering Panel meeting in Reston. Chuck Ivie to attend.

October 5: Videoconference (in bldg 230) with JSO on FROST.

Postponed indefinitely: Cal State Long Beach Second Annual Space Conference. Rob Staehle to attend.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

Aerospace Daily -- 9/14/90

"SENATE PANEL CUTS NASA REQUEST \$1.67 BILLION TO SAVE OUTLAYS"

"The Senate Appropriations VA, HUD and Independent Agencies subcommittee yesterday cut \$1.67 billion from the Administration's \$15.1 billion NASA budget request, trimming Space Station and gutting Space Exploration Initiative (SEI) programs in an effort to cover an overall spending allocation \$2.1 billion less than its House counterpart."

At \$855 million below the House's \$14.3 billion, the Senate's \$13.5 would be a 10 percent increase over the agency's FY '90 appropriations.

Indicating her understanding of the administration's interest in the NASA budget, Sen. Barbara Mikulski (D-Md.) said "...We're talking actively with OMB to improve these numbers." She also said she felt the panel cut too deeply into the Space Station, which suffered a reduction of \$863.6 million from the Administration's request, according to Aerospace Daily.

Resources . . . (from page 1)

different than the Shuttle. We are on track, and this is an expected and normal part of business."

In any complex engineering project, such as the space station and Shuttle, technical managers constantly challenge designers' calculations and numbers, forcing them to search for better, more efficient ways to accomplish a task, said Dr. William B. Lenoir, associate administrator for Space Flight.

"One of the things we're doing is making sure the design we have today reflects the design requirements," Lenoir said.

The PDR, scheduled to culminate in December, is a technical review of the basic design and is conducted prior to, or very early in, the detailed design phase. Following the detailed design phase comes the critical design review (CDR), which is the technical review of specifications and will certify the design of all flight hardware. Typically, no flight hardware is built during these phases, except for test or prototype pieces. The critical design review should be completed in 1992. Once the design passes this stage, it will be frozen and manufacturing will begin.

Checkpoints such as these are placed in the hardware development and mission phases of the Freedom program to ensure the integrity and success of the program, Kohrs has said.

Both Lenoir and Kohrs said they do not foresee any major station design changes. The maturity of the design may bring changes, such as the decision at Work Package 1 at Marshall Space Flight Center (MSFC) in Huntsville, Ala., to forego using stainless steel and move to lighter, but more expensive inconel to build the consumable pressure tanks.

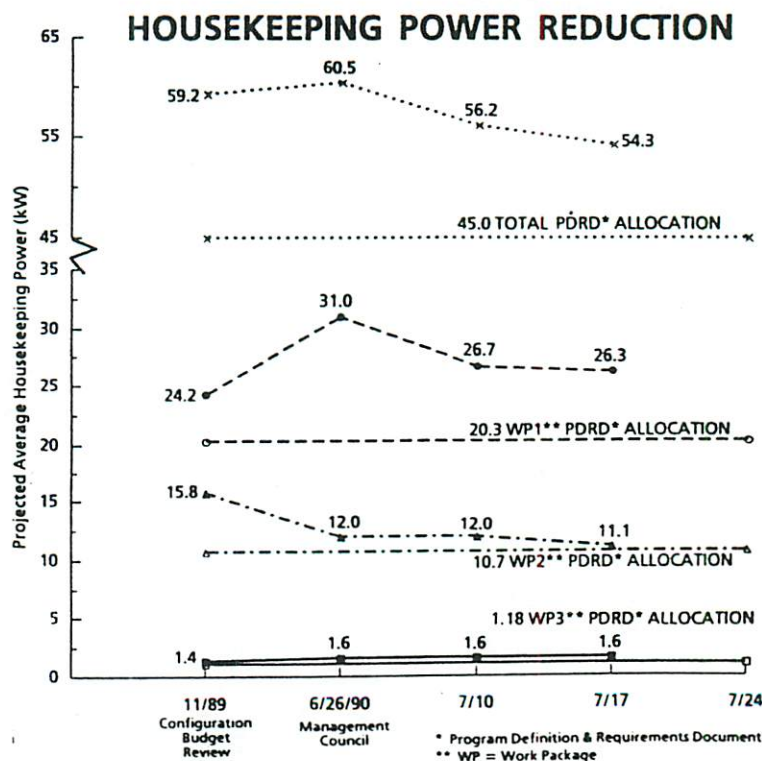
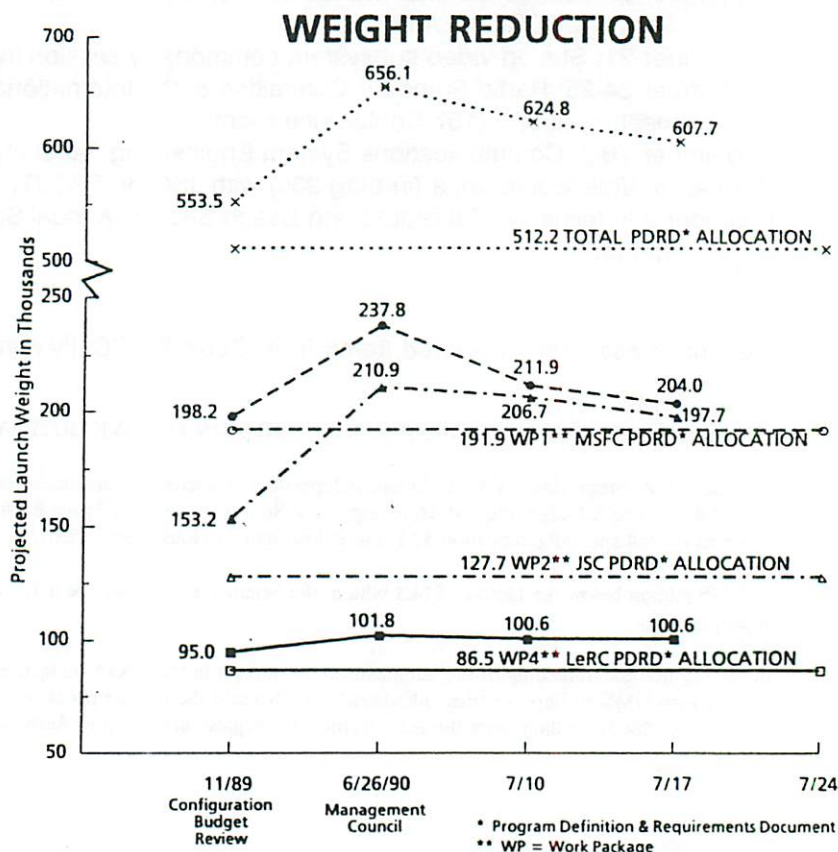
"That move alone saved us 3,000 to 4,000 pounds," said Kohrs.

Work Package 3 at Goddard Space Flight

Center in Greenbelt, Md., is currently under its weight allocation.

"And we've told them that they are by no means required to meet that allocation," Lenoir quipped at the press conference.

Requirements for housekeeping power for each of the work (see Resources, page 8)



Station Break

Publisher Mark Hess/NASA
Editor Lee Ann Landers/TADCORPS
Graphics TADCORPS


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Lee Ann Landers, Station Break/TADCORPS,
600 Maryland Ave., SW, #200, Washington, D.C. 20024,
(202)554-8677

311.4-594

24 September 1990

TO: Distribution

FROM: Lori Paul 

SUBJECT: SS Team Minutes for 24 September 1990

PRESENT: Rob Staehle, Gloria Badilla, Govind Deshpande, Hershal Fitzhugh, Mukund Gangal, Dick Grumm, Paul Henry, Chuck Ivie, Bob Laskin, Kristan Lattu, Irene Petrasek, Lori L. Paul, David Werntz

Next Meeting: 1 October 1990 at 10:30 in 301-169

Help! Distribution for this memo is again now over 100 names. If you want or need the information, great! But if you are no longer working on Space Station, or otherwise have no use for this information, please call Randy Cassingham to have your name removed from the list. It would also be helpful if you switched from paper distribution to NASAmail distribution -- just call Randy Cassingham and he'll switch you over. Help save the forests... and Randy's secretary! Thanks.

Rob Staehle

FY90 ended yesterday (23 September) for Caltech/JPL. At the last moment, JSO received funding to cover the first increment of FY91 expenditures. (The first increment equals 6/52 of FY90 money which had been transferred to JSO from the SSFP.) These funds will cover tasks during the lean carryover period until regular FY91 funds become available. JSO tasks which have been approved for FY91 may begin today; however, that money is not to be used for FY90 deliverables. Tasks which have carryover funds will be allowed to keep the carryover money in addition to the new allocation.

JSO task managers should contact their Reston counterparts to prepare work package agreements (WPAs) and SRM plans for FY91 based upon current budget information. Section-approved WPAs and Division-approved SRMs are due to Rob by close of business on 18 October. Be sure that these packages are sent to Rob and not directly to Reston. SRMs for OSSI tasks are also due on 18 October.

Space Station accounts for tasks which will continue into FY92 must reserve 6-8 weeks of FY91 carryover funds for use during the first weeks of FY92.

The JSO Annual Report is available from Bob Easter.

Rob will be participating in a briefing of the Lunar/Mars Initiative Panel on 25 and 26 September at Ames Research Center. This travel was funded by ARC.

The third annual NASA Ada User's Symposium will take place at JSC on 6 November. The symposium is free and open to the public, but there is a 15 October registration deadline for those who wish to receive proceedings at no cost. Those who miss the registration deadline or who cannot attend the symposium may obtain a copy of the proceedings for \$10.00 (postage and handling included). Contact the University of Houston Software Engineering Professional Education Center (SEPEC) at (713) 282-2223 for additional information.

Govind Deshpande

A video conference with JSO will take place on 26 September to discuss FY91 FROST task strategy. Govind, Bob Aster/311, and Henry Kleine/363 will attend at JPL.

FROST Analysis Study Team (FAST) case study number two, "Analysis of NIU Bandwidths," has been reviewed and will be published on 25 September. Case study number three, an analysis of flow control, will be conducted for JSO in early FY91.

A video conference with JSO will take place 27 September to discuss FY91 SDTM task strategy. Chet Borden/311, George Fox/311, and Jeff L. Smith/311 will attend at JPL.

Irene Petrasek

Irene will be attending Space Station Team meetings for Gerry Murphy/521.

Irene and Gerry Murphy will be working with Bob Laskin/343 and Kristin Bruno/522 to define the environment workbench effort for the next year.

The "quiet zone," an EMC-free zone which will be located on the Station struts between solar panels, has been approved and a CR submitted. This zone will provide an area for experiments that require a low EMC environment.

Paul Henry

Paul has sent the final (fourth) draft of the near-term portion of the Space Station Level I Utilization Plan for FY91 and FY92 to Remer Prince/MUU. Paul is beginning work on the long-term portion of the Plan.

Camille Hayes/632 in Financial Planning has been replaced by Walt Boyd/632. Boyd will now assist those with 510 account numbers.

David Werntz

Launch and assembly sequence planning requirements, received by JSO from the Space Station Engineering Integration Contractor (SSEIC), have been passed on to JPL/Pasadena. David and Steve Loyola/311 are in the process of reviewing the requirements. Subsequently, a work plan will be written.

Bob Laskin

Bob reviewed the "Space Station Freedom PDR Microgravity Environment Definition Document -- Interim Report" and sent a comprehensive critique to Bob Edelson/JSO. Bob Laskin generally approved of the document's approach to analyzing microgravity disturbances, but he also identified several major problems which need to be addressed. Bob sent a copy of the document to Dennis Kern/521 and asked Dennis several questions regarding fiber acoustic disturbances in the 15 hz and higher range.

Dennis Kern and Gloria Badilla/521 attended the Loads and Dynamics Working Group meeting on 27 to 30 August and presented their comments on the the PDR Microgravity Environment Definition document.

The Disturbance Simulation and Management Tool's Program Description Document will be released this week. Sima is wrapping up her DSMT work and moving on soon to CRAF/CASSINI. Her replacement for Space Station work will not be selected until funding is obtained for the position.

Hershal Fitzhugh

Fitz has been attending the Small Rapid Response (SRR) Payload telecons. It appears that KSC intends to maintain the flight containers for SRR payloads. Integration of the payloads into their containers would necessarily take place at KSC. There is some concern that this is not the most "rapid response" way of doing business.

Lab Support Equipment (LSE) is becoming an active issue again. Fitz sent a memo to Valerie Thomas/552 and Kristan Lattu/374 which outlines LSE classification work. Valerie and Kristan will coordinate development of guidelines to apply payload classification (per NMI 810.1A) to LSE.

Kristan Lattu

More LSE telecons have been planned for 3 and 4 October to discuss some specific items of LSE. Kristan will participate.

Mukund Gangal

Mukund Gangal/871 made a viewgraph presentation at the meeting regarding a study performed about a year ago on the development of high efficiency photovoltaic power systems and the application of photovoltaic technology to the Space Station.

Upcoming Meetings

September 20-28: International Standards Workshop for Centers for the Commercial Development of Space (CCDSs) at JPL.

September 24-25: Radio Standard Committee of the International Standards Organization (ISO) meeting at JPL (167-Conference room).

September TBD: Communications System Engineering Panel meeting in Reston. Chuck Ivie to attend.

October 5: Videoconference (in bldg 230) with JSO on FROST.

Postponed indefinitely: Cal State Long Beach Second Annual Space Conference. Rob Staehle to attend.

Canceled: the October 22-23 UDAWG meeting. Some topics will be covered at the UIP meeting that same week.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

Space Fax Daily -- 9/21/90

"ALDRICH SAYS 'ENOUGH' TO THE FREEDOM DEBATE DURING AIAA CONFERENCE"

"I believe that Space Station Freedom is the space station that meets the needs of SEI -- and the needs of this country," said Arnold Aldrich, NASA Associate Administrator for Aeronautics, Exploration and Technology."

SpaceFax reports that Aldrich made these comments while speaking to attendees of a recent American Institute of Aeronautics and Astronautics conference. The newsletter says that Aldrich basically said it was time to push ahead with the momentum of the program and that further debate might result in a situation where the nation lacked critical technologies in the coming decades.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

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Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBreckinridge
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237 ✓	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	HQ	Code MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314 ✓	4-3952	TGlavich	
Glazer, Stu	HQ	Code SN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	Clvie	
Im, Eastwood	334	300-235	4-0492		
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Kern, Dennis	521	301-456	4-3158		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Lewis, Donald W.	797	183-801	4-0840		
Li, Fuk	334	300-235	4-2849		FLi

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Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204			MHumfreville
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-6930		
Nichols, Dave	750	171-225	4-8912		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Petrasek, Irene	???	301-440	?-????		
Pomphrey, Rick	317	301-235	4-3890	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	331	301-170K	4-2544		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Shao, Mike	385	169-214	4-7834		
Sharma, Jayant	312	301-165	3-9616		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
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Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	233-200	4-6786	RHWhite	
Werntz, David	311	601-237	4-1270		
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 104 (81 paper, 24 NASAmail) ✱ Printed 25 September 1990


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-598

1 October 1990

TO: Distribution

FROM: Lori Paul 

SUBJECT: SS Team Minutes for 1 October 1990

PRESENT: Rob Staehle, Govind Deshpande, Hershal Fitzhugh, Dick Grumm, Paul Henry, Chuck Ivie, Roger Kern, Kristan Lattu, Lori L. Paul

Next Meeting: 8 October 1990 at 10:30 in 301-169

Rob Staehle

The following three items are corrections to the last edition of the minutes:

1. Copies of the JSO Annual Report, prepared by Bob Easter, are available from Rob.
2. Rob participated in a briefing about human Mars Exploration at Thomas Stafford's Lunar/Mars Initiative Panel on 26 September in Crystal City, VA (not at Ames Research Center). The travel was funded by ARC.
3. In the "Upcoming Meetings" section last week, the CCDS was spelled out incorrectly. It should have read *Consultative Committee on Space Data Standards*.

A tentative budget agreement has been reached by the Administration and Congress, which reduces the probability that NASA will be required to furlough its employees.

The SSFP is currently the focus of four General Accounting Office (GAO) audits:

1. The original GAO-initiated audit is still on the "back burner".
2. The Congressman Robert Roe-initiated audit.
3. The House Government Operations Committee, Subcommittee on Government Operations and Transportation audit, which is investigating the way SSF requirements were generated and how those requirements will be met by current Station design. Rob answered a number of questions related to this audit.
4. An audit which will investigate the number of Shuttle flights necessary for construction of the Station and the costs of those Shuttle launches.

If anyone is contacted by a GAO auditor, please try to schedule a meeting with them, rather than talk with them on the spot. Then, report the meeting arrangements to Rob and Marthella Greene in the JPL Contracts Management Office (x4-2425). Marthella will provide guidelines for discussion with the auditors. All staff members are asked to be honest and cooperative. Provide the auditors with factual information, avoid speculation and personal opinions.

Robert Moorehead, Deputy Director SSF Program and Operations, stated in a recent memo that there is "...increased emphasis being placed on SSEIC [the Space Station Engineering and Integration Contract] to assume the program-wide integration role..."

Two more CRs have been received:

1. Baseline SSP 30482 Electrical Power Specification and Standards, Vol. I and II (CR #BE 040255 A). Stan Krauthamer/342 will review the CR and send comments to Bob Glass/JSO by 7 October.
2. Storage of Hazardous Chemicals (CR #BJ 020396 A). Gerry Murphy/521 and/or his staff will review the CR.

Bob Glass indicated to Rob that a consolidated CR concerning utility ports will be sent to Paul Henry/311 for review in the near future.

Due to budget constraints, Michael Pasciuto/MU has canceled the request for a second Code MU Information Systems detailee. The position may be resurrected next fiscal year. At the request of his sponsor, David H. Brown/331, the current Information System detailee, will be extending his tenure for another year. Brown has prime responsibility for communications and information processing systems, oversees flight and ground communications architecture and supports negotiations and interfaces with the Office of Space Operations (TDRSS).

Bob Aster/311 provided Al Webb/JSO with viewgraphs summarizing data flow control issues affecting the Station. Al Webb made a presentation to Phil Cressy/SM addressing flow control concerns and the possible application of FROST to flow control simulations.

The Integrated System PDR will begin soon. Tom Kehoe/JSO is coordinating. JSO has produced the Integrated System PDR (ISPDR) Traceability Report which tracks each of the 460 Program Requirements Document (PRD) requirements through the PDRD to the architectural control documents, the top Level III requirements documents, and into the contractor end item specification. The Traceability Report was scheduled for release today (1 October) as both hard copy and in Interleaf format on PALS/TMIS.

The "Standard Life-Cycle Cost (LCC) Management Assumptions" document was distributed on 17 September. The document provides standard LCC management resource marginal cost estimates, guidance on using the estimates for life-cycle cost impact assessments, and a breakdown of the cost estimates by component. The marginal costs were computed using JPL's Station Design and Tradeoff Model (SDTM) Version 1.3.

"Issues in NASA Program and Project Management" (NASA SP-6101-03) edited by Francis T. Hoban/ND, Program Manager for the NASA Program and Project Development Initiative, was sent to Rob this week. Call Lori Paul at 4-1166 to arrange a loan of the booklet.

New guidelines have been published for NASA Honor Awards. Changes in the guidelines reflect a concern that the award process has been too lengthy in the past. Also, there has been a perception that only senior technical staff are nominated and selected for the awards. Nominations of Space Station staff for honor awards should be made to Rob and line management before 15 October.

Govind Deshpande

A video conference took place last Wednesday (26 September) to discuss a FY91 funding strategy for FROST. Bob Aster/311, Henry Kleine/363, Mike Devirian/JSO, and Al Webb/JSO participated in the discussion. Options for FY91 FROST tasks were presented. At the conclusion of the meeting, JSO directed the FROST team to proceed with first quarter plans involving program development and applications. Additional funding for FY91 will be pending arrival of actual FY91 carryover fund information. Firm budget guidelines for FY91 are expected in the next few weeks.

FROST Analysis and Study Team (FAST) case study number two, "Analysis of NIU Bandwidths," was published on 25 September. 25 copies of the study were sent to Al Webb/JSO for

distribution. The primary recommendation made in the case study could result in an approximate doubling of the effective bandwidth of a DMS NIU.

Paul Henry

Last week Paul completed the draft text for the long-term portion of the Code MU Utilization Plan. Work will continue on the draft this week. Comments on the final draft of the short-term portion of the plan are still pending. Rob reported that Remer Prince/MUU had read much of the short-term plan when Rob visited Remer last week. Remer was pleased with the draft, though some of Paul's recommendations required clarification and emphasis of the importance of Code MU representing user interests to diverse NASA offices, such as legal and public affairs.

Roger Kern

Roger Kern/355 made a presentation at the meeting which suggested the possible use of enzymes to control the growth of unwanted bacteria (bio-films) in the water supplies, plumbing, equipment, etc. onboard the Space Station. He reported on research at JPL supported by DARPA.

Kristan Lattu

In response to a recent action item from the SUM, Kristan and Valerie Thomas/552 have begun to coordinate the development of guidelines which will apply payload classification (per NMI 810.1A) to Lab Support Equipment (LSE).

Kristan will be participating in LSE telecon workshops this week (3 and 4 October) to discuss some specific items of LSE.

Hershal Fitzhugh

The next User Design Accommodations Working Group (UDAWG) meeting has been officially canceled. Items on the UDAWG agenda will be discussed at the User Integration Panel (UIP) scheduled for 24 to 26 October in Fair Lakes, VA. Fitz will attend; contact him for further information.

Irene Petrasek

Gerry Murphy/521 is working on an "unofficial" strawman plan for MSU tasks in FY91.

As part of the PDR activity for an electromagnetic test techniques CR, Gerry may participate in a meeting 4 through 5 October at MSFC.

Chuck Ivie

Section 7 of the PDRD has been distributed at JSO for final internal review. A general review will begin approximately three weeks prior to the Communications Systems Engineering Panel (CSEP). The CSEP has not yet been scheduled, however.

Upcoming Meetings

October 5: Videoconference (in bldg 230) with JSO on FROST.

Postponed indefinitely: Cal State Long Beach Second Annual Space Conference. Rob Staehle to attend.

Canceled: the October 22-23 UDAWG meeting. Some topics will be covered at the UIP meeting that same week.

Recent Space Station-related Items from Code P's "Daily News In Brief" (Typos *not* corrected...)

There were no relevant items in the last week.

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Total: 105 (79 paper, 26 NASAmail) * Printed 3 October 1990

311.4-601

8 October 1990

TO: Distribution

FROM: Randy Cassingham *RC*

SUBJECT: SS Team Minutes for 8 October 1990

PRESENT: Paul Henry, Randy Cassingham, Dave Werntz, Philip Leung, Kristan Lattu, Hershal Fitzhugh, Dick Grumm, Bob Aster

Next Meeting: 15 October 1990 at 10:30 in 301-169

Paul Henry

Rob is on travel today.

Sima Lisman's Program Description Document for the Disturbance Simulation and Management Tool has been released. A User's Guide was released in August.

Since Randy Cassingham's task (to write and publish the *Introduction to Utilizing Space Station Freedom* document) is now on indefinite "hold" while the Turbo Team reassesses the Station, Randy is short of work. Anyone needing any assistance with editing or producing documents or reports are encouraged to give him a call.

The Assured Crew Return Vehicle program has been moved so that it is now a part of the Space Station Program.

Robert Moorehead, Deputy Director, Space Station Freedom Program and Operations, has issued a memo regarding the Architecture Control Document. "It is my intent to reinvigorate the role of the ACD and to strengthen the Agent's relationship to the Level II organization," he says in the memo. "The ACD Agent has the responsibility to develop the end-to-end architecture for the assigned system to accomplish the functionality required by the Program Definition and Requirements Document," including all interfaces, including those with the international Partners, and "development of end-to-end system verification requirements and plans". Each ACD Agent will report directly to Moorehead. Assignments have been made for EVA, thermal control, DMS, C&T, GN&C, MS (all of these will be JSC personnel), ECLSS (MSFC) and electrical power (LeRC).

Six EMI/EMC Change Requests came up at the SSCB meeting last Thursday. Gerry Murphy participated in the review board which generated them, and assuming Dana Brewer/MS had adopted the review board's recommendations, Gerry recommended that JSO approve each.

Norm Reilly/311's RALPH (Resource ALlocation and Planning Helper) task for LaRC will be handled as a JSO "pass-through" account. Norm and his people did good work on this.

Paul delivered his first draft of the long-term portion of the Code MU Utilization Plan to Remer Prince/MUU. The plan covers FY93-95 -- including the timespan of the Station's First Element Launch.

Randy Cassingham

The *Introduction to Utilizing Space Station Freedom* document task is still on hold. No word yet on when the hold might be lifted. At issue is whether the document will need substantial revision as the result of the findings by the "Turbo Team". The document was nearly ready for press when the hold was established.

Dave Werntz

The RALPH User's Guide, Software Design Document and Overview document for the Freedom Assembly Sequencing Tool (FAST) prototype have now been delivered to JSO and SSEC. A videocon with Code MSS is scheduled on Thursday to discuss FY91 requirements.

Philip Leung (attending for Gerry Murphy)

Gerry Murphy went to MSFC to review an EMC CR. There will be a telecon with MSFC and LeRC tomorrow to discuss solar array grounding issues.

Kristan Lattu

Kristan is working on a Science Utilization and Management team action item to set up classification guidelines for Lab Support Equipment. The implications of classifications for these items was discussed at length in the meeting.

Hershal Fitzhugh

Fitz has been working mostly on EXOICE lately. Little has been happening with his Space Station tasks.

Dick Grumm

Dick visited McDonnell Douglas in Huntington Beach last week, in part to clarify the MCPF requirements on the DMS. In the course of their discussion, they were able to devise a preliminary architecture for the MCPF data system using mostly Space Station computer components. It appears that the MCPF will need to implement the IEEE 488 bus via a user-provided card. While at MDSSC, Dick "listened in" to the presentation made by Mark Foster/MDSSC to the DMS Mode Team.

Bob Aster

Bob, who works in Section 311, has been working on FROST. FROST has been split into two subtasks: Applications (which Bob is heading) and Development, which Henry Kleine/363 is heading. FY91 funding looks reasonably good at this point. The Applications Team will initially focus on flow control issues. The Development Team will be adding functionality to FROST to support application efforts.

Upcoming Meetings

October 23-25: Evolution Working Group meeting at LaRC. Paul Henry and/or Jeff H. Smith to attend.
October 23-26: User Integration Panel Meeting in Fairlakes VA. Topics that were to be discussed in the previously canceled UDAWG meeting will be discussed here. Hershal Fitzhugh to attend.
Postponed indefinitely: Cal State Long Beach Second Annual Space Conference. Rob Staehle to attend.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

Baltimore Sun -- 10/3/90

"NASA'S PALE PACHYDERM" By Daniel Greenberg (this is a column of opinion)

"The albatross known as the space station has scraped through another cycle of congressional skepticism, but only because of Washington's aversion to killing even misbegotten high tech ventures."

The column states that congress is on its way to pruning the project but the major effect will be to render the station anemic while maintaining its expense.

The writer says that fiscal folly is compounded by a remarkable dearth of purpose for the station and that the latest round in budget cuts has caused NASA's partners -- Japan, European Space Agency countries, and Canada -- to cry foul.

The column also cites comments from Representative Bill Green (R-N.Y.) whose recent address to the members of the Institute of Electronics and Electrical Engineers included the statement that NASA had spent \$4 billion on the station so far and had nothing to show for it.

The writer concludes by stating that political courage is required to terminate a project with \$4 billion worth of pork but that kind of courage is lacking in Congress. The station, he sighs, will stumble on.

Wall Street Journal -- 10/4/90

"SENATE BILL CUTS NASA SPENDING FOR KEY PROJECTS" By David Rogers

"The Senate approved a \$78.6 billion science and housing bill that would wipe out nearly all new funding for the Moon and Mars initiative and cut \$863.6 million from the space station's 1991 budget."

The Journal says the Bush administration is sure to fight to restore funding during a conference with the House and the final outcome of the bill will be influenced by the reallocation of appropriations pending the current budget accord on the Hill.

The story says the Senate appropriations committee has been operating under much tighter constraints than its House counterpart and therefore has been forced to cut deeper into project funding for NASA.

Space Business News -- Oct. 1-Oct. 13

"STATION TAKES FIRST WHACKS AT FISHER-PRICE

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The story says among the changes are reductions in the Crew Health Care Facility, deleting the Ku-band space-to-space comm system, and reducing the data management system to less than 3,000 watts of power.

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JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-606

15 October 1990

TO: Distribution

FROM: Lori L. Paul

SUBJECT: SS Team Minutes for 15 October 1990

PRESENT: Rob Staehle, Bob Aster, Dick Grumm, Paul Henry, Chuck Ivie, Kristan Lattu, Irene Petrasek, Lori L. Paul

Next Meeting: 22 October 1990 at 10:30 in 301-169

Rob Staehle

The Director's Review and Discussion (DRD) of Space Station, originally scheduled for 22 October, has been canceled. It has not yet been rescheduled.

A Change Request meeting took place at NASA Headquarters on 12 October to discuss negative versus positive grounding issues on the Space Station. Gerry Murphy participated. Rob suggested that a teleconference between JSO and JPL on negative versus positive grounding might be useful. He asked Irene Petrasek to determine if Gerry Murphy/521 and Stan Krauthamer/342 also felt such a telecon might be worthwhile. (See additional discussion of this subject by Irene Petrasek.)

Jim Cutts/800 has replaced Frank Wright/740 in OSSSI as head of Instruments Definition and Development. All OSSSI Space Station related work now reports through Rob to Jim Cutts, who in turn reports to Charles Elachi/700. The new appointment was announced last week.

The Planetary Society has published "Summary Report, Planetary Society Workshop -- Enhancing the United States' Space Station Program: Alternatives and Constraints" (19 September 1990). For a copy of this report, contact Tim Lynch, The Planetary Society, (818) 793-5100.

A Level II viewgraph presentation which summarizes Space Station structural loads analysis plans is available. Topics covered include: a loads cycle process flow chart; load combinations including berthing, EVA, docking, Shuttle plume, and RCS (Reaction Control System) loads; uncertainty factors; and priority load cases. Contact Lori Paul at x4-1166, mail stop 601-237, to obtain a copy of this viewgraph package.

Two uses of the acronym "FAST" currently exist: The FROST Analysis and Study Team (FAST) and the Freedom Assembly Sequence Tool (FAST). Rob has requested that one of the acronym users change their title so that confusion between the identical acronyms can be eliminated. Bob Aster/311 of the FROST FAST has volunteered to replace his team name with Communication Analysis Team (CAT).

JSO has received sufficient FY91 funds to sustain their tasks through the end of this calendar year.

Bob Easter/JSO is seeking a senior JPL management person with information systems expertise to sit on a panel which will assess the Grumman Space Station Engineering and Integration Contractor (SSEIC) Data Management System (DMS) software, planning and related tasks. Art Zygielbaum/750 and Mike Sander/206 have been contacted.

Robert Moorehead/Deputy Directory, SSF Program and Operations, recently announced that Craig Sinclair/Level II has been "...assigned the responsibility to lead and coordinate redundancy

management activities for the SSFP. To perform his assigned responsibilities, Mr. Sinclair will serve as Deputy Director for Redundancy Management in the Avionics Systems Office."

The "Spacelab to Space Station Freedom Transition Study, Interim Report: Transition of the Drop Physics Module-1 to SSF" (September 1990) by Donald W. Lewis/797 has been published. Dick Grumm contributed to this activity.

Copies of "Space Station Freedom Disturbance Simulation and Management Tool," a paper presented at the 1990 AIAA Guidance, Navigation, and Control Conference (20-22 August 1990) by Sima Lisman/343 and co-written by David Rathbun/343, are now available.

Contact Lori Paul at x4-1166, mail stop 601-237, to obtain copies of the above documents.

Some of the Work Package-1 weight reductions recommended by the "Turbo Team" have been obtained by declaring that the mass for all user rack structures and subsystems will be chargeable to the Users of the Station. (See other "Turbo Team" User impacts in the electronic mail message attached to the minutes.)

Irene Petrasek

Bob Clark/Level II, Manager of Payload Accommodations, will be conducting an annual review of the environment work which supports MSU this Tuesday (16 October) via a telecon which will discuss obligations, cost, status, schedule, accomplishments to date, and plans for FY91 tasks. Gerry Murphy will lead the JPL presentation. Rob, Irene, Kristin Bruno/522 (or her representative), Hank Garret/521, and Philip Leung/521, will attend the review.

Gerry Murphy participated in an Engineering Review telecon last Friday (12 October). Grounding issues were discussed at length. Richard Tinius/MSE decided to assemble a "Tiger Team" to supervise a series of tests which will provide a more accurate assessment of grounding requirements on the Space Station. Tinius realizes that delaying a decision regarding grounding may cost more money; however, he feels that making the wrong decision at this time would cost a lot more in the long term.

Gerry Murphy produced a viewgraph package that outlines a grounding test plan ("Integrated Space Station Grounding Configuration Test Plan") in response to grounding concerns expressed at the recent telecons.

Bob Aster

A FROST Flow Control Analysis Plan was sent to Allan Webb/JSO on 10 October. The final report for the study is due to JSO on 27 November. Govind Deshpande/311 has already completed a draft of section one of the analysis.

On 10 October, Henry Kleine/363 made a presentation for the Systems, Software, and Operations Resource Center (SSORCE) Noontime Briefing Series: "FROST - A System for Simulating Communications Networks." The lecture was well attended and well received.

Kristan Lattu

Hershal Fitzhugh will attend the upcoming Mission Management Director's Review (MMDR) and Science Utilization Management Director's Review (SUMDR). The exact schedule for these meetings has not yet been announced.

Kristan's Lab Support Equipment (LSE) classification guidelines memo will be sent to Gary Wickes/MSFC, SUM Team Chairman, by 16 October.

Dick Grumm

Dick is evaluating Space Station User safety review procedures. Dick notes that Users must now pass three separate safety reviews:

1. SSFP Safety Review
2. A MSFC safety review, because Marshall processes all payloads
3. A NSTS safety review, because the payload must be carried on the Shuttle.

Integration of all the safety review requirements into a single process, and coordination of such a review from a single source in the SSFP, is needed. Rob suggested that Dick discuss safety review concerns with Paul Henry/311 who could bring them to the attention of Remer Prince/MUU. Kristan commented that the problem of multiple safety reviews and the need for a single process has been addressed in both Section 1 of the PDRD and the PRD, but that the requirements have apparently been ignored or deleted since she was last involved. Bob Glass/JSO or Tom Kehoe/JSO should check on this as part of requirements tracing.

Larry Simmons/790 recently hired Lauren Liverman to head advanced development activities for Microgravity.

Chuck Ivie

Chuck continues to work on Section 7 of the PDRD. Currently, he is checking the usage of terms and procedures for consistency throughout the document. There is some concern that what is meant by a term in one portion of the document may mean something entirely different when that same term is used in another section. Multiple meanings among terms and processes must be reconciled. Chuck has prepared a glossary for Section 7 to help resolve this problem.

Chuck is in the process of transferring to JPL Section 311.

Lori Paul

The Communications Analysis Team (CAT), formerly the FROST Analysis and Study Team, will publish a revised version of "Analysis of Virtual Channels, FAST Case Study 1" next week (22 October). This version incorporates comments on the original study received from Al Webb/JSO and others.

A FROST Object Library database, which will support FROST analysis studies, is being designed by Lori and Jerry Olivieri/311. A work plan for this task will be sent to Al Webb/JSO by close of business 17 October.

Response to the survey memo seeking to identify those interested in TMIS access was very poor. TMIS access is currently planned for a single site at JPL's Woodbury/IPC (Information Processing Center) Building 601. A plan for establishing a TMIS node at this location will be sent to Rob by next week.

Paul Henry

Items on the UDAWG agenda will be discussed at the User Integration Panel (UIP) scheduled for 24 to 26 October in Fair Lakes, VA. Paul and Hershail Fitzhugh will attend; contact Paul or Fitz for further information.

The Evolution Working Group (EWG) meeting at LaRC, formerly scheduled for 23-25 October, has been postponed one week to 30 October to 1 November. Systems studies will be reviewed at that meeting. Paul and Jeff H. Smith/311 plan to attend.

On 16 and 17 October McDonnell Douglas in Huntington Beach will demonstrate EVA and telerobotic aerobraking in a neutral buoyancy tank. A tour of the Douglas facility and several brief lectures will also be offered. Paul, Rob, Jeff H. Smith/311, and Cate Heneghan/311 plan to attend.

Paul continues to receive requests for his Mars Trajectory video.

Larry Baresi

Larry Baresi/355 gave a brief presentation at the meeting regarding waste treatment in space through the utilization of aerobic and anaerobic biological processes. Those interested in additional information on this subject may contact Larry at x4-2944.

Upcoming Meetings

October 24-26: User Integration Panel Meeting in Fairlakes VA. Topics that were to be discussed in the previously canceled UDAWG meeting will be discussed here. Hershal Fitzhugh to attend.
October 30-November 1: Evolution Working Group meeting at LaRC. Paul Henry and/or Jeff H. Smith to attend.

TBD: Mission Management Director's Review (MMDR) and Science Utilization Management Director's Review (SUMDR), location TBA. Hershal Fitzhugh to attend.

The following is the current milestone schedule for the ISPDR:

12-25 Oct.	Prepare Data Package #1 (documents unaffected by Turbo)
26-28 Oct.	Ship Data Package #1
2-7 Nov.	Prepare Data Package #2 (docs affected by Turbo to include impacts up to Turbo Team #2)
8-10 Nov.	Ship Data Package #2
13-16 Nov.	Design & Requirements Presentations at Reston (will attempt to include ALL Turbo impacts)
13-30 Nov.	Review of Data Packages, writing of RIDs
30 Nov.	RID cut-off (off-site and at Reston)
30Nov-14Dec.	RID disposition
14-16 Dec.	Prepare for pre-board
17 Dec.	Pre-board
18-19 Dec.	Prepare for board
20 Dec.	Board
25 Dec.	Christmas

Updates to follow when necessary

Keith Cowing
Pressurized Payload Accommodations
Utilization and Operations Office

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Houston Post -- 9/28/90

"NASA FINDS WAYS TO CHOP NUMBER OF SPACE WALKS" By John Gravois

"Great strides have been made in recent weeks to allay grave concerns about astronauts having to make an extraordinary number of space walks to maintain the proposed Space Station Freedom, NASA officials said Thursday."

The Houston Post's Washington bureau reports that Space Flight Chief Bill Lenoir testified before Congress that space walks can be reduced to one every week or ten days and that the agency is continuing to reduce the number of space maintenance hours required for Freedom.

The story says that Lenoir also reported to members of the House Space Science and Applications subcommittee that other cost-cutting improvements to the station are being made. The story notes that the members of the subcommittee expressed to Lenoir their support of the program but also stressed severe budget constraints which will force them to scrutinize NASA's operations as never before.

Associated Press -- 10/11/90

"SPACE DEBRIS" By Harry Rosenthal

"Spacefaring nations are scattering so much junk into near-Earth orbit that shuttle flights could become too dangerous by the end of the decade, a congressional agency said today."

The AP quotes from a section of the report, issued by the Office of Technology Assessment, and states that "the presence of debris in low-Earth orbits, where fast moving objects could pierce inhabited spacecraft such as the planned international space station Freedom, and the Soviet space station Mir, is especially troublesome because of the risk to human life."

AP reports that, as of last week, the U.S. Space Command was tracking 6,645 artificial objects orbiting Earth, each larger than a softball and weighing a total of about 4.5 million pounds. The wire says that some experts believe there could be as many as 30,000 to 70,000 objects smaller in size.

The story says the cost of removing the space junk or capturing the objects and returning them to Earth is high and not worthwhile at the present risk level. AP says the Office of Technology Assessment is recommending that space station designers acquire more data on this problem and design shielding into the station.

Space Fax Daily -- 10/11/90

"POLL FINDS CHILDREN EAGER TO GO TO MARS"

"In a poll sponsored by Purdue University, 64 percent of 1,500 USA children surveyed between ages 10 and 14 said they would go to Mars if there were a flight leaving tomorrow." The story, which paraphrases a USA Today report, says 70 percent of the children surveyed believe a mission to Mars is possible by the year 2020.

Posted: Tue, Oct 9, 1990 1:44 PM EDT

Msg: NJJA-2910-8784

From: CMCLEMORE

To: SUM.BB,

(UN:SUM.BB, PRMD:GSFC, O:GSFCMAIL, ADMD:TELEMAIL, C:USA),

(UN:SUM.BB, PRMD:GSFC, O:GSFCMAIL, ADMD:TELEMAIL, C:USA),

(UN:SUM.BB, PRMD:GSFC, O:GSFCMAIL, ADMD:TELEMAIL, C:USA)

Subj: FARLEY'S ASSESSMENT OF TURBO SCRUB HITS TO USERS

FOR YOUR INFORMATION.

CAROLE

Forwarded message:

Posted: Tue, Oct 9, 1990 1:24 PM EDT

Msg: UJJA-2910-8747

From: BFARLEY

To: GWICKS, CMCLEMORE, RARNOLD, CJONES, VHOUSTON, BFARLEY,
DAVIDASMITH

CC: WCRYSEL

Subj: TURBO SCRUB HITS TO USERS FOR WP01

OSSA USER IMPACTS

WP-01 SYSTEMS DESIGN REVIEW OF TURBO SCRUB CONFIGURATION
(ALREADY BASELINED BY MOORHEAD)

OCTOBER 1-2, 1990

I. CHANGES IN USLAB RESOURCES AVAILABLE TO THE USERS

A. POWER: FROM 0 - 30 KW TO 0 - 12 KW

B. RACKS: FROM 29 TO 28 FOR GLSF, LSE AND USER HDW

GLSF - 4 RACKS

LSE - 7 TO 9 RACKS

USER HDW - 15 TO 17 RACKS

C. AVIONICS AIR COOLING: FROM 5.5KW TO 3.7KW

OR FROM 190 TO 132 WATTS AVERAGE PER RACK

D. THERMAL CONTROL SYSTEM WATER COOLANT LOOP

1. HIGH TEMP LOOP (70 DEG F) WAS CHANGED TO A "MODERATE"
TEMP LOOP AND THE COOLING CAPABILITY CHANGED FROM 0 TO
15 KW TO 0 TO 12 KW

2. THE LOW TEMP LOOP (35 DEG F) COOLING CAPABILITY WAS
CHANGED FROM 0 TO 10.8 KW TO 0 TO 7.4 KW.

II. PART OF THE WP-01 WEIGHT REDUCTION WAS ACCOMPLISHED BY DECLARING THAT THE MASS FOR ALL USER RACK STRUCTURES AND SUBSYSTEMS WERE CHARGEABLE TO THE USERS.

A. THIS APPLIES TO THE VOLUME, POWER, ETC. FOR THE SUBSYSTEMS
EQUIPMENT LOCATED IN THE 28 USER RACKS ALSO.

B. ACCORDING TO VERBAL COMMENTS, THE SINGLE EXCEPTION TO THE
ABOVE STATEMENT IS THE POWER FOR THE GLSF WILL BE CHARGED
AGAINST SUBSYSTEMS POWER.

C. THE RACK SUBSYSTEMS POWER REQUIREMENTS THAT ARE NOW BEING
CHARGED TO THE USERS IS ROUGHLY 300 WATTS PER RACK.

III. REDUNDANCY MANAGEMENT/FAULT TOLERANCE GUIDELINES

A. ALLOWS PERFORMANCE DEGRADATION AFTER FIRST FAILURE FOR
UTILITIES AND USER SERVICES.

B. ALLOWS ZERO FAULT TOLERANCE FOR FUNCTIONS SUPPORTING
OPERABILITY OF ANY SINGLE PAYLOAD

C. SAFETY MONITORING AND EMERGENCY CONTROL FUNCTIONS SHALL FAIL

OPERATIONAL WITH NO DEGRADATION

D. ALLOWS ZERO-BASE AUTO LOAD SHEDDING FOR ELECTRICAL POWER DISTRIBUTION

E. THE PLM POWER IS ZERO FAULT TOLERANT

IV. GLSF (LS GLOVEBOX, MS GLOVEBOX, LAB SCIENCES WORK BENCH AND PMMS/UPWS RACK) CHANGES

A. THE BLOWERS FOR THE LS GLOVEBOX AND LAB SCIENCES WORK BENCH ARE DOWNSIZED FROM 300CFM TO 25 TO 50CFM

B. THE LS AND MS GLOVEBOX INTERFACES WITH THE TCS COOLANT, THE UPWS AND WATER RECLAMATION SYSTEM HAVE BEEN DELETED

V. USLAB RACK CONFIGURATION CHANGES

A. COMPOSITE RACK MATERIAL MADE OF 3/8" HONEYCOMB SANDWICH WITH AN INTERNAL COPPER GRID.

B. TWO RACK CONFIGURATIONS, THE ISPR FOR USERS AND THE "FUNCTIONAL UNITS" FOR THE SUBSYSTEMS RACKS.

- C. SSFP MAY NEED TO OCCUPY ONE USER RACK FOR FMS WATER STORAGE PRIOR TO ASSEMBLY COMPLETE.

VI. TCS LOOP CHANGES

- A. THE USLAB SUBSYSTEMS AND USER COOLANT LOOPS HAVE BEEN COMBINED AND THE HIGH TEMP LOOP IS NOW A MODERATE TEMP LOOP
- B. THE MODERATE AND LOW TEMP LOOPS ARE NOW TOTALLY SEPARATE LOOPS EXCEPT DURING FAILURE MODE OPERATIONS WHEN THEY ARE BOTH DRIVEN BY ONE PUMP THROUGH CROSS-STRAPPING PLUMBING.
- C. NOW ONLY ONE SET OF EXTERNAL HEAT EXCHANGERS
- D. ONLY TITANIUM OR STAINLESS METALS ARE PERMITTED IN THE TCS COOLANT LOOPS.
- E. REDUNDANCY IN THE NODE TCS COOLANT LOOPS HAS BEEN DELETED ALONG WITH THE NODE RACK AUTO FLOW CONTROL VALVES.
- F. THE USLAB PLUMBING LEAK DETECTION SYSTEM HAS BEEN DELETED.
- G. THE PLM TCS IS ZERO FAILURE TOLERANT AND HAS NO LOW TEMP LOOP WHEN DISCONNECTED FROM THE SSF.

VII. USLAB ELECTRICAL POWER (12 KW TO USERS)

- A. THE USLAB POWER IS NOW SUPPLIED BY FOUR 6.25KW DDCU'S LOCATED IN SOME AS YET UNSPECIFIED RACKS WITHIN THE LAB.
- B. THE AUTO LOAD SHEDDING MEANS THAT IF ANY ONE OF THE FOUR DDCU'S FAIL, PAYLOADS WILL BE SYSTEMATICALLY SHUTDOWN TO GET THE USLAB BACK WITHIN THE CAPABILITY OF THE REMAINING THREE DDCU'S.
- C. THE 15KW RACKS HAVE BEEN CHANGED TO 12KW RACKS
- D. THE POWER DISTRIBUTED TO PAYLOAD RACKS IS ONLY FAIL SAFE REDUNDANT FOR 3 AND 6 KW RACKS.
- E. THE 12 KW RACKS ARE FED BY TWO 6KW CABLES AND ARE ZERO FAILURE TOLERANT.
- F. THE USER MUST MAINTAIN ISOLATION BETWEEN THE TWO 6KW FEEDS IN THE 12 KW RACKS.
- G. THE ESSENTIAL BUSS WIRING IN EACH RACK IS THE USER'S RESPONSIBILITY.
- H. THE RPCM'S (CIRCUIT BREAKER MODULES OR CARDS) FOR SUPPLYING POWER TO USER EQUIPMENT IN EACH RACK HAVE BEEN DELETED. THE RPCM'S FOR THE SUBSYSTEMS HARDWARE IN EACH USER RACK WERE NOT DELETED.
- I. THE MANUAL CONTROL PANELS (MCR'S) FOR OPERATING THE RPCM'S HAVE BEEN DELETED. THEREFORE, THE CIRCUIT BREAKERS CAN ONLY BE OPERATED BY THE DMS KEYBOARD.

VIII. DATA SYSTEMS CHANGES

- A. MULTIPLE RACKS SHARE MDM'S
- B. 16 CMDM'S AT PMC AND 23 CMDM'S AT AC

IX. FMS/ECLSS CHANGES

- A. INTEGRATED FMS/ECLSS WATER STORAGE STILL IN PROCESS
- B. WP-01 HAS NO USER REQUIREMENTS FOR WATER QUALITY AT PMC.
- C. THE OXYGEN AND NITROGEN GAS SUPPLIED TO USERS ARE ZERO FAULT TOLERANT.
- D. NO REDUNDANT POWER TO FIRE AND SMOKE DETECTORS.
- E. THE ULTRAPURE WATER SYSTEM WILL NOW USE OZONE FOR STERILIZATION AND ELECTRODEIONIZATION FOR PURIFICATION

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Aster, Bob	311	601-237	4-1369		
Badilla, Gloria	521	301-456	249-5252		
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brown, David	331	Code MU	8-453-1179	DHBrown	
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280 ✓	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Cutts, Jim	800	180-604	4-4120		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	HQ	Code MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314 ✓	4-3952	TGlavich	
Glazer, Stu	HQ	Code SN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	CIvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kern, Roger	355	89-2	4-2233		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Levin, Dick	311	601-237	4-1253		
Lewis, Donald W.	797	183-801	4-0840		
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	

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Mahoney, M.J.	383	168-327	4-5584	MJMahoney	NSCAT
Martin, Benn	780	264-648 ✓	4-8263	Benn	
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr.	Stockton, CA 95204	MHumfreville	
Millard, Jerry	354	89-1	4-2898	BMuirhead	
Muirhead, Brian	352	158-224	4-8179		
Murphy, Gerald	521	301-460	4-4952		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Petrasek, Irene	521	301-460	?-????	RPomphrey	
Pomphrey, Rick	366	100-22 ✓	584-2964		
Pravdo, Steve	381	168-222 ✓	4-3131		
Rayman, Marc	331	301-170K	4-2544	LRosenberg	
Reiz, Julie	640	512-110	7-7664		
Rosenberg, Leigh	311	601-237	4-1251		
Sanders, Felicia	363	510-264	7-9988		
Sergeevskv, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318	WSchober	
Schober, Wayne	881	180-603	4-8581		
Shao, Mike	385	169-214	4-7834		
Shishko, Bob	311	601-237	4-1282		
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Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
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Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673	MUrban	
Urban, Mike	120	Reston ✓	8-457-7591		
Varsi, Giulio	880	180-603	4-2992		
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600	AWebb	
Webb, Allan	120	Reston ✓	8-457-7589		
White, Robert H.	784	233-200	4-6786	RHWhite	
Wernitz, David	311	601-237	4-1270		
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	
Zenone, Ron	782	264-648	4-2543	RZenone	
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	


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Total: 106 (80 paper, 26 NASAmail) * Printed 18 October 1990

311.4-607

22 October 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: Space Station Team Meeting Minutes for 22 October 1990

PRESENT: Rob Staehle, Randy Cassingham, Govind Deshpande, Steve Loyola, Dick Grumm, Kristan Lattu, Chuck Ivie, Henry Kleine, Gerry Murphy

Next Meeting: 29 October 1990 at 10:30 in 301-127

Note: Due to a conference room conflict, next Monday's meeting (only) will be in the conference room shown. We'll be back in 301-169 the week after.

Rob Staehle

The House and the Senate has agreed on a FY 91 Space Station funding level of \$1.9 billion (FY 90's Station budget was \$1.7 billion). This is a substantial reduction from the Administration's request of \$2.5 billion. They have also agreed on a straight 8% per year increase from now on (some say until a cap of \$2.5 billion is reached) rather than the larger spending increases NASA has wanted. A "smaller" Space Station may be in the works. It is unknown at this point what any of this means for JPL.

There is an all-day meeting in Reston today to review the assembly sequence. It appears that some of the inherent flaws in the current sequence are coming to light.

All Reston task managers should now have their funding guidelines for FY 91. All Pasadena task managers of JSO-funded tasks **should have division-approved FY 91 SRMs to Rob by Monday, October 29** for his approval and forwarding to JSO.

Another of the Code MU-sponsored "Station Break" newsletters is out, yet no one on any JPL Space Station-related task has received one. Randy Cassingham will attempt to place everyone on this memo's distribution list on the "Station Break" distribution list. Anyone not wishing to receive the newsletter should advise Randy as soon as possible.

Rob, Cate Heneghan and others from JPL attended neutral buoyancy simulations of EVA and robot-assisted assembly of a Mars piloted mission aerobrake structure last week at McDonnell Douglas/Huntington Beach. The simulation was performed by former astronaut Pete Conrad in a Hamilton Standard EVA suit with other MDSSC employees manipulating the robot arm and assisting in the pool. The full-scale aerobrake structure was provided to MDSSC under a very inexpensive contract with the Mars Mission Research Center, operated by North Carolina State University and North Carolina Agricultural & Technical State University, funded out of MDSSC internal research and development (IRAD) funds. Dr. Fred DeJarnette, MMRC director (919/737-2365) would be a useful contact for anyone at JPL wishing to consider similar prototype hardware design, fabrication and simulation.

Randy Cassingham

There is no change in the status of the *Introduction to Utilizing Space Station Freedom* document task -- it is still on hold pending Code-MU's decision on what to do about the Turbo Team's recommendations. Remer Prince has promised to let Randy know in a few days when a decision will be made regarding the task. In the meantime, Randy is in search of work...

Govind Deshpande

The FROST Analysis and Study Team (FAST) was renamed (due to a conflict with another team named FAST) to the Communications Analysis Team (CAT). Bob Vuolo will be the JSO lead for the CAT; Allan Webb will continue as the lead for FROST development. The other FAST, Chet Borden's Freedom Assembly Sequence Team, retains its title.

Chuck Ivie will be working on CAT for at least the next six months.

An object library for FROST has been programmed and a user's guide and data dictionary have been drafted. Data entry will begin on schedule.

A high rate flow control analysis has been begun. A preliminary draft of some sections of the report for the analysis has been sent to Bob Vuolo. The final report is due November 30. The Space Station does not presently plan for end-to-end flow control on the high rate data downlink. Govind and Chuck Ivie have proposed a reverse channel on the high rate link's status. Chuck explained that as a consequence of not having flow control, users would be likely to underutilize their link to reduce the frequency of link interruptions, which are difficult to correct without some sort of flow control.

Henry Kleine

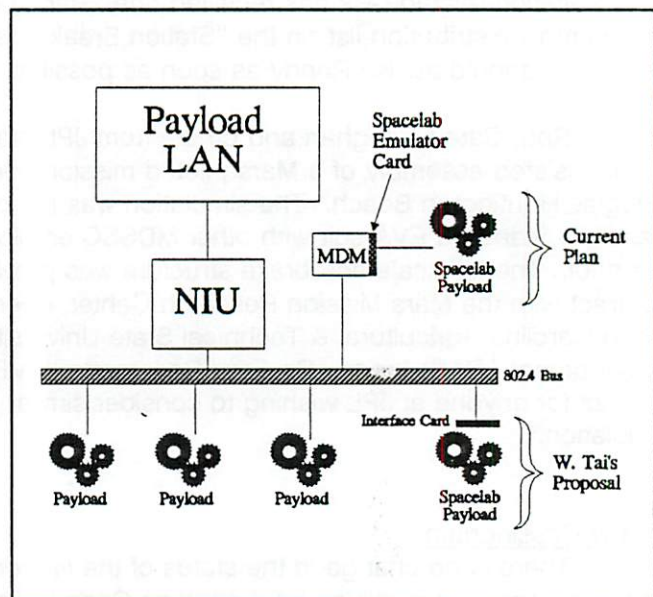
Due to funding uncertainties, Henry has lost two programmers and is working on re-staffing. He may be able to get both programmers back, though one only temporarily, but even that might take some time. Deliverables will be impacted; he will discuss the impact with Reston and Bob Aster when he has a better idea as to what the impact will be.

Steve Loyola (RALPH/FAST)

The RALPH task had a videocon with JSO and SSEIC last Thursday. The functionality for the software has been settled, but the platform has not. SSEIC wants the system to be on Macintoshes; the programmers are familiar with -- and have -- PCs, and PCs have been planned for. Another videocon is planned for this Thursday to settle this. Bill Bastedo/MSS did not attend last week's telecon; he is considered crucial to this week's as he is responsible for assembly sequence planning. It is not clear how today's assembly sequence review will affect the JPL task.

Dick Grumm

Dick's exercise to support the Spacelab-to-Space Station Transition Study continues. Current plans call for a Multiplexor-Demultiplexor (MDM) to provide, with an added card, a matching interface between any Spacelab payloads and the bus that goes to the Network Interface Unit (NIU), which goes to the Space Station's Payload Local Area Network (LAN). Wallace Tai has proposed that, at least for the Drop Physics Module, the MDM might be done away with (as it is heavy, bulky, and expensive) and instead add a card to the payload to perform the required 802.4 bus interfacing. This concept was discussed at some length in the meeting. A block diagram of the interfaces is shown. Many other issues, including the scientific value of verifying limited-scope Spacelab equipment, remain to be considered.



Kristan Lattu

Hershal Fitzhugh is at the User Integration Panel meeting this week.

Kristan received a draft of the *Attached Payload Accommodations Equipment Generic Payload ICD* for review. She passed it on for Paul Henry to take a look at it.

Kristan reported on a draft of a paper she and Fitz have prepared responding to a Code SM request for our recommendations regarding payload classification (i.e., A, B, C or D) guidelines for Space Station laboratory support equipment (LSE). She described an OSSA interpretation of the recent NMI 8010.1A ("Classification of NASA Payloads") Agency-wide classification guidelines which indicates that OSSA payloads would only rarely be assigned to Class A, and then generally only at the facility level, rather than for individual experiments. In response to a request from Bob White and Hershal Fitzhugh, Valerie Thomas/521 recommended that all LSE be made to Class A specifications. JPL SUM personnel feel that this is in conflict with OSSA's stated interpretation of 8010.1A and that OSSA budgets will not support LSE development under Class A guidelines. Rob indicated that Kristan should provide a review copy of her recommendation to Valerie. Rob will provide guidance by Friday on release of the recommendation paper as a JPL document. If unresolved as to whether the paper will be an "official" document, the recommendations may explicitly note the different positions taken by different internal organizations.

Chuck Ivie

Chuck is in the process of moving -- he is transferring to Section 311 and will be working on FROST analysis. He and Bob Aster will be attending the CSEP meeting next week.

Gerry Murphy

Gerry supported the Space Station Control Board meeting via telecon last Wednesday with Al Wittelsey. The agenda called for the review of six EMC documents. However, administrative issues and electrical grounding dominated the session, which ran until 8:00 P.M. Eastern time. A LeRC CR to the PDRD requiring that *all* Station systems (including payloads) be negatively grounded was approved; Gerry warns that this could have serious consequences for attached payloads. Stan Krauthamer/342 also contributed to the discussion and prior review of Electrical Power System documents.

No SDTM activity was reported.

Upcoming Meetings

October 24-26: User Integration Panel Meeting in Fairlakes VA. Topics that were to be discussed in the previously canceled UDAWG meeting will be discussed here. Hershal Fitzhugh to attend.
October 29-31: Mission Management Director's Review (MMDR) in Washington. Hershal Fitzhugh and Bob White to attend.
October 29-November 2: Review of grounding test plan and plasma requirements at LeRC. Gerry Murphy and Peter Leung to attend.
October 30-31: Communications System Engineering Panel (CSEP) meeting in Reston. Chuck Ivie and Bob Aster to attend.
October 30-November 1: Evolution Working Group meeting at LaRC. Paul Henry and/or Jeff H. Smith to attend.
December 4-6: OSSA Microgravity Science and Applications Division (MSAD) Intercenter Systems Engineering Team meeting at JSC. Emphasis will be on safety. Chuck Ivie to attend.
TBD: Science Utilization Management Director's Review (SUMDR), location TBA.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

Aviation Week -- Oct. 22-Oct. 28

"WASHINGTON ROUNDUP"

"Richard N. Malow, staff chief of the House subcommittee that handles NASA appropriations, had some pointed fiscal advice for the space agency as it navigates treacherous budget waters: stop overloading the boat."

The magazine says that Malow has cautioned NASA to expect no more than 8 to 10 percent increases in its annual budget. Aviation Week says Malow cautions that this budget limitation will not support a fifth shuttle, a space station, an Earth Observing System, an Advanced Launch System, a National Aero-Space Plane, a permanent Moon base and other items NASA wants.

Malow is quoted by the magazine as saying "the problem is the de-scoping has never matched the budget envelope."

Florida Today -- 10/23/90

"HUBBLE TROUBLE: REPAIR LIST GROWS" By Todd Halvorson

"Space Shuttle astronauts will make not one but possibly three dangerous spacewalks on a five day flight to fix the Hubble Space Telescope in 1993, officials said Monday."

The paper reports that although NASA had already planned for an as-yet-named astronaut crew to repair the planetary camera aboard the telescope, the agency is now planning to replace the flapping solar panels and is considering a fix to the faint object camera as well.

The paper quotes Hubble program scientist Ed Weiler as saying, "the trouble is they are doing this butterfly-wing thing. They are designed to bend but they are wobbling more frequently than they should...if we're going to be up there anyway, we're going to replace the solar arrays. We're going to fix the problem once and for all."

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Aster, Bob	311	601-237	4-1369		
Badilla, Gloria	521	301-456	249-5252		
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brown, David	331	Code MU	8-453-1179	DHBrown	
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280 ✓	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Cutts, Jim	800	180-604	4-4120		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	HQ	Code MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314 ✓	4-3952	TGlavich	
Glazer, Stu	HQ	Code SN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	CIvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
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Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	


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311.4-615

29 October 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: Space Station Team Meeting Minutes for 29 October 1990

PRESENT: Rob Staehle, Randy Cassingham, Richard Grumm, Paul Henry, Hershal Fitzhugh

Next Meeting: 5 November 1990 at 10:30 in 301-169

Rob Staehle

The FY91 budget is finally finalized. The Space Station was allocated \$1.9 billion (out of a \$2.45 billion request). As a result of the cut in the Station's budget growth, Richard Kohrs (Director, Space Station Freedom) has issued several edicts, effective immediately:

- "1) Prevent any increase in contractor workforce, including the subcontractor level [this includes JPL]
- 2) Refrain from initiating any contracts for new activities.
- 3) Constrain, to the absolute minimum, all spending for the continuation of discretionary efforts.
- 4) Put on hold, until further notice from me, all contract awards for FY 1991 Construction of Facilities (SSPF and NBL)."

Rob has received FY91 SRMs from Wallace Tai. SRMs for other JSO-funded tasks are due by COB today.

Jeff H. Smith/311 and Robert Shishko/311 have issued an interesting memo: "Selection of EVA, EVR [extravehicular robotics], or Cooperative EVA/EVR for Space Station Operations: Trade-offs Between Crew and telerobot Work Systems". Bob Shishko will be presenting this at this week's Evolution Working Group meeting at LaRC.

Bob Moorehead issued a memo on a November 15-16 meeting to discuss program-wide data bases and applications. Team members from SDTM, CAT, FAST and MESSOC may wish to learn more about this meeting, as all use or could use program-wide data bases of design information. Tom Kehoe is the JSO contact.

The next meeting of the Space Station Science and Application Advisory Subcommittee (SSSAAS) will be held November 28-30 at GSFC. The Subcommittee has requested presentations from the Space Station *Freedom* Program Office on PDR status, Turbo Team activities and status, early utilization of the Station, and a DMS briefing.

CAT/FROST reports their progress by memo: their Flow Control Study is on schedule. The FROST Object Library's data entry has started and is on schedule. Bob Aster and Chuck Ivie are en route to the Communications System Engineering Panel meeting, being held this week in Reston. The FROST case study (Analysis of Virtual Channels) has been revised and sent to Allan Webb/JSO for review. The second case study (Analysis of NIU Bandwidths) has been modified in accordance with review comments from Bob Edelson, and will be sent to JSO for distribution approval.

Kudos to Hershal Fitzhugh, who has been named supervisor to 374's Instrument Integration and Test group. He's not off the hook, though: Fitz is still JPL's representative to the OSSA Science Utilization Management (SUM) team.

Dick Grumm

Stan Krauthamer is working on power supply issues on the Spacelab to Space Station Transition Study. Currently, plans call for a converter to change the Space Station-supplied power to conform to the power specifications of Spacelab. This might add unnecessary redundancy (and cost and weight); Stan is looking into alternatives. Dick noted that the Data Management System people have shown great flexibility on experiment interfaces, and considers their attitude quite helpful.

Hershal Fitzhugh

Fitz attended the combined User Integration Panel/User Design Accommodations Working Group (UDAWG) meeting last week. Also included was the PICCWG -- the Payload Integration Center Certification Working Group -- meeting. Moorehead is apparently concerned about the multitude of working groups and has ordered that up to 80% of them be discontinued. UDAWG was among the first to go -- it is now dead, as, apparently, is the PICCWG (at the PICCWG meeting, Fitz noted that their "real" interest was certifying testbed facilities at KSC -- not the same as certifying payload integration centers. He suggested that the working group pull back and rescope their intent).

At the UIP meeting, the topic was the integrated systems PDR, which included ground facilities, documentation, etc. OSSA seemed to state that they will not significantly support the Station's IS-PDR; they apparently expect an 80% cut in OSSA's overall Space Station support budget.

The Turbo Team's "mode" team reports that the DMS has a very flexible interface. Apparently, several different protocols can be used, and interface cards will be available from more than one manufacturer to keep the price down.

An OSSI retreat was held recently; certification and small instrument development was discussed.

Kristan Lattu's report on classification recommendations for Lab Support Equipment is being put into final form for Gary Wickes/MSFC (the head of the SUM team). A meeting was held Friday with Valerie Thomas/521, Merlin Crossman/521, Kristan, Fitz, and Rob, where considerable progress was made in resolving differences over recommendations in Kristan's draft. A final 52x meeting was scheduled for this afternoon to review incorporation of their comments.

Paul Henry

Paul talked with Barry Epstein this morning; he had mentioned that the Turbo Team was "speeding up" -- now, Congress has demanded that their study be completed in 90 days or the next Station funding increment will be held up.

The new Chief of Level 1 Operations and Utilization (replacing Carolyn Griner) is Dr. John-David Bartoe. Bartoe was previously the Station's Chief Scientist (the new Chief Scientist is Dr. William Taylor).

Paul has received comments from the review of his short-term portion of the Code MU Utilization Plan. Remer Prince/MU likes it, but there has been no response yet from Carolyn Griner. She did, however, mention that she wants Level 1's Utilization Office to take a more central role -- Paul couldn't agree more. The long-term portion of the Plan has also been delivered. Barry Epstein likes it, but thinks it will be a few weeks before Bartoe, who is taking over for Griner, gets a chance to read it and make comments.

The EWG meeting is currently slated for Wednesday through Friday at LaRC. Paul will be attending, as will Cate Heneghan/311 and Bob Shishko/311, who will present the paper on EVA/EVR trade-offs.

Paul has been sentenced to Jury Duty, starting November 7.

No activity was reported for SDTM, Freedom Assembly Sequence Tool (FAST), robotics, or MESSOC.

Upcoming Meetings

October 29-November 2: Review of grounding test plan and plasma requirements at LeRC. Gerry Murphy and Peter Leung to attend.

October 30-31: Communications System Engineering Panel (CSEP) meeting in Reston. Chuck Ivie and Bob Aster to attend.

October 31-November 2: Evolution Working Group meeting at LaRC. Paul Henry, Cate Heneghan and Bob Shishko to attend.

November 7-9: MSAD Retreat in Melbourne FL.

November 27-28: Mission Management Director's Review (MMDR) in Washington. Hershaf Fitzhugh and Bob White to attend.

November 28-30: Space Station Science and Application Advisory Subcommittee (SSSAAS) meeting at GSFC. Bob White to attend.

December 4-6: OSSA Microgravity Science and Applications Division (MSAD) Intercenter Systems Engineering Team meeting at JSC. Emphasis will be on safety. Chuck Ivie to attend.

TBD: Science Utilization Management Director's Review (SUMDR), location TBA.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

No relevant items to report.

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Aster, Bob	311	601-237	4-1369		
Badilla, Gloria	521	301-456	249-5252		
Beck, Andy	521	301-466	4-4575	AJBeck	
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Breckinridge, James	385	169-314	4-6785		JBBreckinridge
Brown, David	331	Code MU	8-453-1179	DHBrown	
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280 ✓	4-3730	RCoffin	
Colavita, Mark	385	169-214	4-7835		
Cutts, Jim	800	180-604	4-4120		
Das, Radhe	342	303-300	4-9736		
Deshpande, Govind	311	601-237	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	HQ	Code MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314 ✓	4-3952	TGlavich	
Glazer, Stu	HQ	Code SN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	311	601-237 ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	366	301-440	4-6045	CIvie	
Im, Eastwood	334	300-235	4-0492		
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kern, Roger	355	89-2	4-2233		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Kossmann, William	120	Reston	8-457-7207		
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Lemmerman, Loren	790	233-200	?-????		
Levin, Dick	311	601-237	4-1253		
Lewis, Donald W.	797	183-801	4-0840		
Li, Fuk	334	300-235	4-2849		FLi
Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		

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Lyu, Michael	522	125-233	4-5411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	
Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204	8-457-7223	MHumfreville	
Merrill, Orin	120	Reston			
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-4952		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Petrasek, Irene	521	301-460	?-????		
Pomphrey, Rick	366	100-22 ✓	584-2964	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	312	301-170K	4-2544		
Reiz, Julie	640	512-110	7-7664		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Sanders, Felicia	363	510-264	7-9988		
Sergeyevsky, Andrey	312	301-165	4-7622		
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Shao, Mike	385	169-214	4-7834		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Taylor, William	HQ	Code M-8 ✓	8-453-2961	WWTaylor	
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	313	233-306	4-6673		
Urban, Mike	120	Reston ✓	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	233-200	4-6786	RHWhite	
Wernitz, David	311	601-237	4-1270		
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zenone, Ron	782	264-648	4-2543	RZenone	RZenone
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 109 (83 paper, 26 NASAmail) * Printed 30 October 1990


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-618

5 November 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: Space Station Team Meeting Minutes for 5 November 1990

PRESENT: Rob Staehle, Randy Cassingham, David Werntz, Kristan Lattu, Richard Grumm, Hershal Fitzhugh, Philip Leung, Robert Aster, Charles Ivie

Next Meeting: 12 November 1990 at 10:30 in 301-169

Note: Due to the large number of attachments, this week's Minutes is being sent via paper to all on the distribution list (i.e., including those who normally only get it via NASAmail). *Please take this opportunity* to review the distribution list. Please make sure everything is correct, and that you wish to continue to receive these memos. Please contact **Randy Cassingham** (x4-1273, ms 601-237, NASAmail RCassingham) if you need any changes made, including changing from paper copies to NASAmail copies or to be deleted from the list. Thanks.

Rob Staehle

Richard Kohrs distributed a letter on "Space Station Restructure Assessment" that outlined how NASA will react to the FY91 (and beyond) budget limitations. The assessment "will be performed within the existing program structure, with a focus at Level II and involvement of the Level III work package/project managers, and contractors, the international partners, and the users. ... All changes in requirements, budget allocations, and schedule will be implemented by formal directives from the Director. Despite possible major changes in the program resulting from the restructuring, it is essential that any changes be against a solid baseline. Therefore, we must not delay the ongoing Integrated System Preliminary Design Review (ISPDR), and it will be completed on the planned schedule." An attachment listed the "ground rules" for the restructure assessment:

1.

FY 1991	1.9 billion
FY 1992	2.1 billion
FY 1993	2.3 billion
FY 1994	2.5 billion
FY 1995	2.6 billion
FY 1996	2.6 billion
FY 1997	2.6 billion
2. Develop a phased approach with quasi-independent phases. Phases can, and probably will, overlap but must stay within the overall program budget limits. Phases may be advanced or slipped with respect to each other. Options should be developed to optimize this phased approach.

Phases to include are:

- a) Man-tended capability
- b) Man-tended utilization
- c) Power increments (~18.75 increments each) to 75 kW total

- d) Hab module and man systems
- e) Permanently manned utilization (4 person crew)
- f) International modules (JEM, APM)
- g) 8 person crew capability

Additional phases can be added following this assessment, as appropriate, for consideration in the long term.

3. Protect the high priority of life sciences and materials sciences.
 4. Achieve international partner capability. Minimize impacts to international partners, including hardware/software interfaces and schedule to maximum extend reasonably possible. The goal is to maintain the international agreements.
 5. Achieve FEL [First Element Launch] as early as possible. At least one option should hold FEL in March 1995.
 6. Achieve man-tended capability as early as possible.
 7. Permanent manned capability remains a commitment of the program.
 8. Simplify the design and the assembly process, but use existing architecture, concepts, and design as much as possible.
 9. Limit assembly flights to no more than 4 per year.
 10. Identify all development that does not directly support the baseline configuration.
 11. Alternate management structures are not to be considered in this assessment.
-

Task managers for JSO pass-through tasks -- especially FAST and environmental areas -- should be visible and aggressive about obtaining continued sponsorship. FAST, especially, would be a good tool for analyzing options in the restructuring process. There will be substantial pressures at Level II to eliminate work not performed there, so unique expertise critical to solving the most important Space Station problems should be emphasized.

OSSA's Science Utilization Management Team (to which Hershal Fitzhugh is JPL's representative) has developed a listing of the user impact of the current Turbo Team scrub of the Station. It is summarized here:

Posted: Wed, Oct 31, 1990 10:42 AM EST Msg: LJJA-2915-1548
 From: CMCLEMORE
 To: SUM.BB,
 Subj: TURBO ASSESSMENT CORRECTIONS

THESE ARE CORRECTIONS TO BEN FARLEY'S PAST TURBO TEAM ASSESSMENT BASED ON THE WORK PACKAGE-01 TELECON HELD ON OCTOBER 14, 1990.

WP-01 SYSTEMS DESIGN REVIEW OF TURBO SCRUB CONFIGURATION
 (ALREADY BASELINED BY MOOREHEAD)
 OCTOBER 1-2, 1990

- I. CHANGES IN USLAB RESOURCES AVAILABLE TO THE USERS
 - A. POWER: FROM 0 - 30 KW TO 0 - 12 KW
 - B. RACKS: FROM 28 1/2 TO 28 FOR GLSF, LSE AND USER HDW
 - PMMS(WGM & UPW) - 1 1/2 RACKS
 - GLSF - 3 RACKS
 - LSE - 7 TO 9 RACKS \ 24 RACKS
 - USER HDW - 15 TO 17 RACKS / TOTAL
 - C. AVIONICS AIR COOLING: FROM 5.5KW TO 3.7KW
 OR FROM 190 TO 132 WATTS AVERAGE PER RACK
 - D. THERMAL CONTROL SYSTEM WATER COOLANT LOOP

1. HIGH TEMP LOOP (70 DEG F) WAS CHANGED TO A "MODERATE" TEMP LOOP AND THE COOLING CAPABILITY CHANGED FROM 0 TO 15 KW TO 0 TO 12 KW
 2. THE LOW TEMP LOOP (35 DEG F) COOLING CAPABILITY WAS CHANGED FROM 0 TO 10.8 KW TO 0 TO 7.4 KW.
 3. THE TOTAL WATER COOLING AVAILABLE TO USERS IS NOW 14.9 KW.
- II. PART OF THE WP-01 WEIGHT REDUCTION WAS ACCOMPLISHED BY DECLARING THAT THE MASS FOR ALL USER RACK STRUCTURES AND SUBSYSTEMS WERE CHARGEABLE TO THE USERS.
- A. THIS APPLIES TO THE VOLUME, POWER, ETC. FOR THE SUBSYSTEMS EQUIPMENT LOCATED IN THE 24 USER RACKS ALSO.
 - B. ACCORDING TO VERBAL COMMENTS, THE GLSF POWER AND VOLUME AND PMMS POWER AND MASS WILL BE CHARGED AGAINST SUBSYSTEMS ALLOCATIONS.
 - C. THE RACK SUBSYSTEMS POWER REQUIREMENTS THAT ARE NOW BEING CHARGED TO THE USERS IS ROUGHLY 300 WATTS PER RACK.
- III. REDUNDANCY MANAGEMENT/FAULT TOLERANCE GUIDELINES
- A. ALLOWS PERFORMANCE DEGRADATION AFTER FIRST FAILURE FOR UTILITIES AND USER SERVICES.
 - B. ALLOWS ZERO FAULT TOLERANCE FOR FUNCTIONS SUPPORTING OPERABILITY OF ANY SINGLE PAYLOAD
 - C. SAFETY MONITORING AND EMERGENCY CONTROL FUNCTIONS SHALL FAIL OPERATIONAL WITH NO DEGRADATION
 - D. ALLOWS ZERO-BASE AUTO LOAD SHEDDING FOR ELECTRICAL POWER DISTRIBUTION
 - E. THE PLM POWER IS ZERO FAULT TOLERANT
- IV. GLSF (LS GLOVEBOX, MS GLOVEBOX, LAB SCIENCES WORK BENCH AND PMMS/UPWS RACK) CHANGES
- A. THE BLOWERS FOR THE LS GLOVEBOX AND LAB SCIENCES WORK BENCH ARE DOWNSIZED FROM 300CFM TO 25 TO 50CFM
 - B. THE LS AND MS GLOVEBOX INTERFACES WITH THE TCS COOLANT ONLY THROUGH A HEAT EXCHANGER.
 - C. THE UPWS AND WATER RECLAMATION SYSTEM INTERFACES WITH THE LAB SCIENCES WORK BENCH AND THE MAINTENANCE WORK STATION HAVE BEEN DELETED.
- V. USLAB RACK CONFIGURATION CHANGES
- A. COMPOSITE RACK MATERIAL MADE OF 3/8" HONEYCOMB SANDWICH WITH AN INTERNAL COPPER GRID.
 - B. TWO RACK CONFIGURATIONS, THE ISPR FOR USERS AND THE "FUNCTIONAL UNITS" FOR THE SUBSYSTEMS RACKS.
 - C. SSFP MAY NEED TO OCCUPY ONE USER RACK FOR FMS WATER STORAGE PRIOR TO ASSEMBLY COMPLETE.
- VI. TCS LOOP CHANGES
- A. THE USLAB SUBSYSTEMS AND USER COOLANT LOOPS HAVE BEEN COMBINED AND THE HIGH TEMP LOOP IS NOW A MODERATE TEMP LOOP
 - B. THE MODERATE AND LOW TEMP LOOPS ARE NOW TOTALLY SEPARATE LOOPS EXCEPT DURING FAILURE MODE OPERATIONS WHEN THEY ARE BOTH DRIVEN BY ONE PUMP THROUGH CROSS-STRAPPING PLUMBING.
 - C. NOW ONLY ONE SET OF EXTERNAL HEAT EXCHANGERS
 - D. ONLY TITANIUM OR STAINLESS METALS ARE PERMITTED IN THE TCS COOLANT LOOPS.
 - E. REDUNDANCY IN THE NODE TCS COOLANT LOOPS HAS BEEN DELETED ALONG WITH THE NODE RACK AUTO FLOW CONTROL VALVES.
 - F. THE USLAB PLUMBING LEAK DETECTION SYSTEM HAS BEEN DELETED.
 - G. THE PLM TCS IS ZERO FAILURE TOLERANT AND HAS NO LOW TEMP LOOP WHEN DISCONNECTED FROM THE SSF.
- VII. USLAB ELECTRICAL POWER (12 KW TO USERS)
- A. THE USLAB POWER IS NOW SUPPLIED BY FOUR 6.25KW DDCU'S LOCATED IN SOME AS YET UNSPECIFIED RACKS WITHIN THE LAB.
 - B. THE AUTO LOAD SHEDDING MEANS THAT IF ANY ONE OF THE FOUR DDCU'S FAIL, PAYLOADS WILL BE SYSTEMATICALLY SHUTDOWN TO GET THE USLAB BACK WITHIN THE CAPABILITY OF THE REMAINING THREE DDCU'S.
 - C. THE 15KW RACKS HAVE BEEN CHANGED TO 12KW RACKS
 - D. THE POWER DISTRIBUTED TO PAYLOAD RACKS IS ONLY FAIL SAFE REDUNDANT FOR 3 AND 6 KW RACKS.
 - E. THE 12 KW RACKS ARE FED BY TWO 6KW CABLES AND ARE ZERO FAILURE TOLERANT.
 - F. THE USER MUST MAINTAIN ISOLATION BETWEEN THE TWO 6KW FEEDS IN THE 12 KW RACKS.
 - G. THE ESSENTIAL BUSS WIRING IN EACH RACK IS THE USER'S

RESPONSIBILITY.

- H. THE RPCM'S (CIRCUIT BREAKER MODULES OR CARDS) FOR SUPPLYING POWER TO USER EQUIPMENT IN EACH RACK HAVE BEEN DELETED. THE RPCM'S FOR THE SUBSYSTEMS HARDWARE IN EACH USER RACK WERE NOT DELETED.
- I. THE MANUAL CONTROL PANELS (MCR'S) FOR OPERATING THE RPCM'S HAVE BEEN DELETED. THEREFORE, THE CIRCUIT BREAKERS CAN ONLY BE OPERATED BY THE DMS KEYBOARD.

VIII. DATA SYSTEMS CHANGES

- A. MULTIPLE RACKS SHARE MDM'S
- B. 7 PAYLOAD CMDM'S AT PMC AND 23 PAYLOAD CMDM'S AT AC

IX. FMS/ECLSS CHANGES

- A. INTEGRATED FMS/ECLSS WATER STORAGE STILL IN PROCESS
- B. WP-01 HAS NO USER REQUIREMENTS FOR WATER QUALITY AT PMC.
- C. THE NITROGEN GAS SUPPLIED TO USERS IS ZERO FAULT TOLERANT.
- D. NO REDUNDANT POWER TO FIRE AND SMOKE DETECTORS.
- E. THE ULTRAPURE WATER SYSTEM WILL NOW USE OZONE FOR STERILIZATION AND ELECTRODEIONIZATION FOR PURIFICATION

X. ECLSS AND THC

- A. AVIONICS AIR DUCTS WILL BE COMPOSED OF COMPOSITE MATERIALS
- B. ALTHOUGH IT IS NOT YET DECIDED, THE MOST PROMISING NEW CONFIGURATIONS FOR THE AVIONICS AIR SYSTEM INCLUDES REDUNDANT FANS.
- C. FOUR OF THE EIGHT CEILING FANS HAVE BEEN DELETED FROM THE USLAB AND THE CEILING FANS HAVE BEEN DELETED FROM THE NODES
- D. NO AIR COOLING CAPABILITY IS PROVIDED FOR PAYLOADS LOCATED IN THE NODES.

As noted last week, Moorehead has become concerned about the multitude of working groups and has ordered that up to 80% of them be discontinued. A new "approved" structure for (1) panels and (2) working groups is attached to the minutes (and, for NASAmil minutes recipients, mailed separately). The first page of each pair shows the previous structure, the second page shows the new structure.

Space Station-related travel restrictions, which were made formal in October, have been lifted. However, we should still be careful to limit travel as much as possible. Consider video teleconferences where they are a viable alternative.

The Station's cabin pressure is again under debate. Members of the Aeronautics and Space Engineering Board, including Tom Stafford, "were insistent" that reducing cabin pressure could reduce the Station's weight (no... not from heavy air, but from the beefed-up structures to support a greater pressure); life sciences people want it at Earth sea-level pressure, or 14.7 psi. Bill Raney/M is helping to arrange a meeting of appropriate structures and life sciences people to explain their positions.

Randy Cassingham

As promised, Remer Prince responded to Randy's inquiry about whether it might be possible to get the *Introduction to Utilizing Space Station Freedom* document task up and running again. The answer, unfortunately, is no: he still wants to wait for the final results of the Turbo Team scrub before letting the document be published. Until he can secure a replacement charge number, then, Randy is working a reduced schedule, taking Fridays off.

David Wernitz

The issue as to whether to develop FAST on a PC or Macintosh platform seems to be settled -- development is back on track to the intended target, PCs. The PC platform will enable faster development of a useful tool for Bill Bastedo/MSS. Bill is expected to make the final decision very soon. The FAST team will try to have some sort of support available in the next few weeks to help support the 90 day Restructure Assessment.

Kristan Lattu

Kristan's paper, *Guidelines for the Classification of Space Station Freedom Laboratory Support Equipment and General Laboratory Support Facilities*, is off the press and in distribution.

Kristan and Fitz, as SUM team members, received a survey from OSSA's Utilization Technology Working Group. The group is an international body looking at technology enhancements for the Station, using Spacelab as a testbed. Kristan and Fitz will respond to the survey, and welcome any inputs from others.

A couple of Laboratory Support Equipment telecons were held last week, which Kristan supported. Several items have been recommended for deletion: the autoclave, washer/sterilizer, and possibly the UV sterilizer (if no experiment has specifically requested it for science experiment use, such as exposure of organisms to UV radiation). Other items' requirements are being fine tuned, including requirements for microscopes and X-ray equipment.

Dick Grumm

At the December 4-6 OSSA Microgravity Science and Applications Division meeting, December 5 will be set aside for safety issues. MSFC and JSC don't seem to be in complete agreement over safety issues. For instance, a pilot light on the Drop Physics Module "must" be contained in several safety layers (because it is made of glass and is pressurized with halogens), but Bonnie Dunbar, an experienced astronaut, shrugged off such precautions -- 'don't you think an astronaut can change a light bulb without breaking it?' Dr. Dunbar apparently feels that some safety requirements are being imposed on users in excess of those needed to ensure a reasonable level of safety.

On December 14, representatives from the Science Utilization Management Level III Data Base Data Management System group will be here to gather information from users (i.e., at JPL, Dick) regarding DMS requirements. Bob Aster and others may sit in to gain more insight into DMS issues.

Dick is interested in knowing if other JPL scientists may be able to use the Microgravity Containerless Processing Facility for other science. He noted possible applications for interstellar gas grain simulation discussed with ARC scientists. Dick will consider organizing a seminar to solicit other interest.

Hershal Fitzhugh

As a member of the Small Rapid Response payload group, he received a request for data regarding a Cosmic Dust Collector demonstration. JSC is developing a proposal submission: "Flight Demonstration for On-orbit Robotic Harvesting of Flight Experiments from a SSF Externally Mounted Payload Facility", which would be mounted on the Cosmic Dust Collection Facility (CDCF). The CDCF is the facility that EXOICE fits into; this is a very similar task that Fitz thinks would be helpful to have run as a testbed on Spacelab for EXOICE.

Philip Leung

Section 521 personnel participated in a review last week of Electrical Power System grounding strategy, and in a review of three documents related to Station electrical and plasma issues.

JPL has been asked to submit a test plan to Dana Brewer/MS for exposure of anodized surfaces to the space plasma environment. The plan is to be sent to Dana Wednesday after Tom Gindorf's/521 review, and is expected to involve approximately six weeks of testing in JPL's Building 144 vacuum chamber. Results are needed in December. This may result from an earlier request from MDSSC for JPL to perform materials tests. Rob indicated to MDSSC that such a request would need to come from NASA. Testing is also to be performed at MSFC and LeRC; Philip is negotiating with them about which testing JPL can best handle in the limited time available. He is participating in weekly telecons.

Bob Aster

The FROST Object Library programming is on schedule for delivery in about two weeks. The FROST Flow Control Study is also on schedule; a final report will be delivered November 30.

The Communications Systems Engineering Panel was on the list of panels canceled last week. However, the previously scheduled meeting was held, and called the "Communications Systems Engineering meeting" instead. A summary of the high points are attached to the minutes (memo from Bob Aster and Charles Ivie). At the meeting, there was an interesting discussion on redundancy management. There seems to be a trend toward trading reliability for redundancy that greatly disturbs both Bob and Chuck Ivie -- they don't necessarily compare.

Bob noted a particularly useful presentation by Mark Tousant/ESA regarding his reservations about the DMS, including his calculation of a one-way time lag of ~2.75 seconds for a command from the ground to a payload.

Chuck Ivie

Chuck gave a presentation on data types at the CSE meeting. The main point that he made is that data type nomenclature should not be taken lightly as different data types have different architectural consequences. His viewgraphs (referred to also in the attached trip report) are available on request. He noted that an original list of 28 data types has been pared to seven or eight. Chuck will work with Bob Vuolo/JSO and Chuck Lynch to prepare a "white paper" or some written discussion of resolving the semantics problem to Mike Devirian/JSO by November 14. There is a danger that varying interpretation of requirements by differing parts of the program could result in serious deficiencies when diverse hardware and software elements are integrated and put in operation.

No activity was reported for SDTM, robotics, MESSOC, evolution studies, or utilization planning.

Upcoming Meetings

November 7-9: Microgravity Science and Applications Division Retreat in Melbourne FL. Dick Grumm to attend.

November 13-16: Integrated Systems Preliminary Design Review meeting in Reston. No one slated to attend.

November 16: Space Station Payload Safety Document meeting at HQ. Hershal Fitzhugh, Kristan Lattu and Dick Grumm will participate via telecon.

November 27-28: Mission Management Director's Review (MMDR) in Washington. Hershal Fitzhugh and Bob White to attend.

November 28-30: Space Station Science and Application Advisory Subcommittee (SSAAS) meeting at GSFC. Bob White to attend.

December 4-6: OSSA Microgravity Science and Applications Division (MSAD) Intercenter Systems Engineering Team meeting at JSC. Emphasis will be on safety. Chuck Ivie and Dick Grumm to attend.

December 14: SUM Level III Data Base team here. Dick Grumm is primary meeting interface.

TBD: Science Utilization Management Director's Review (SUMDR), location TBA.

Recent Space Station-related Items from Code P's "Daily News in Brief" (Typos *not* corrected...)

Philadelphia Inquirer -- 10/30/90

"SPACE STATION, EXPLORATION FALL VICTIM TO BUDGET CUTS"

"Congress refused to spend any money for President Bush's plan to send astronauts to the moon and Mars, saying the country cannot afford it now."

The paper says the Congress trimmed more than a half-billion dollars from the space station, even as it increased NASA's overall budget by 13 percent over last year.

According to the Inquirer, the legislators told NASA it would not continue to grow fiscally like this in the future and the agency should develop the station in useful phases or risk losing the \$38 billion project altogether.

The story quotes a passage from the conference bill which puts NASA on notice, "it is essential that the agency recognize that the budget crisis is only beginning."

According to the report, the conference bill cut \$210 million from research and technology, deleted the \$15 million earmarked for construction of a new space station crew training tank, cut \$125 million for space shuttle operations, cut \$25 million from the life sciences program plan but stipulated that \$12.1 million be spent on the Search for Extraterrestrial Intelligence, but added \$30 million to the budget for the Hubble Space Telescope.

Associated Press -- 10/30/90
"COSMONAUTS SPACE WALK"

"Soviet cosmonauts, working in open space for nearly four hours, failed today in an attempt to repair a malfunctioning hatch aboard the Mir space station, the official Tass news agency said."

AP's Moscow bureau reports that cosmonauts Gennady Manakov and Gennady Strekalov worked through the night to fix a door which had failed to close properly during a spacewalk in July. According to the Tass report, AP says the cosmonauts "did not manage to correct the hatch malfunction."

The report says that there is no danger to the crew or the space station, though, as a result of the failure to repair the hatch.

The story also says that the Soviet Union's manned space program, which has for decades been a source of national pride, has been plagued in the past two years by a series of docking equipment failures, cosmonaut mistakes and budget cuts.

Playboy Magazine -- December Issue
"WHAT NASA WANTS FOR CHRISTMAS"

"We don't know about you, but we're kind of worried about NASA. You remember NASA. Big agency, lots of gizmos, nifty logo, rocket jockeys with names like Deke and Gus and Gordo who wore silver suits and said 'A-OK' and 'Can Do.'"

The magazine says that today's NASA is filled with people with names like Frederick and Brewster who dress up in powder blue jump suits and click off terms such as "nominal" and "on line."

The story continues stating that the old NASA had ships dubbed "Eagle" and "Saturn" that carried men to the moon but the new NASA has missions called "STS-41C" which carry tomato seeds into orbit.

The report continues by stating -- most importantly -- the old NASA built things that actually worked and the new NASA builds shuttles that leak and would build a space station that fell apart before it was occupied.

The story then takes a turn and says, "but, hey, it's Christmas, and even a Federal agency can dream," and then presents in pictures a photo essay of the agency's dreams including the space station, the trip to Mars with humans, the National Aero-Space Plane, the Cassini probe and others. The story ends by hoping NASA has been an agency of "good little boys and girls."

Space News -- Oct. 29-Nov. 4
"SPACE STATION PARTNERS IN STATE OF HIGH ANXIETY" By Leonard David

"NASA's international partners in the space station Freedom program anxiously are awaiting news on the U.S. agency's response to recent congressional action to rein in the facility's size and cost."

The story says that several representatives of the European partner nations have already expressed concern that curtailment of space station activities could have a chilling effect on any future cooperation.

The story quotes John Logsdon, director of the Space Policy Institute of George Washington University, as saying "it's time for mutual truth telling. All the partners now recognize that the plans they laid out in the optimism of 1983 and 1985 are not the plans they are going to execute in 1991, 1992 and 1993."

The story continues to quote Logsdon, and attributes to him comments that the partners knew early on the political foundation of the project was a very weak one but that cooperation with the United States was the most assured path to a space station they all could use. Logsdon is quoted as saying "it is time to see if there is a flexibility in the very rigid space station agreements. If somehow the space station partnership falls apart, it will be a long time before there will be the ability to carry out large scale enterprises. It is a crucial test."



National Aeronautics and
Space Administration

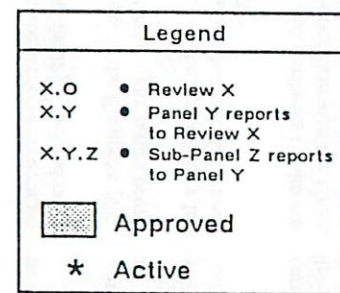
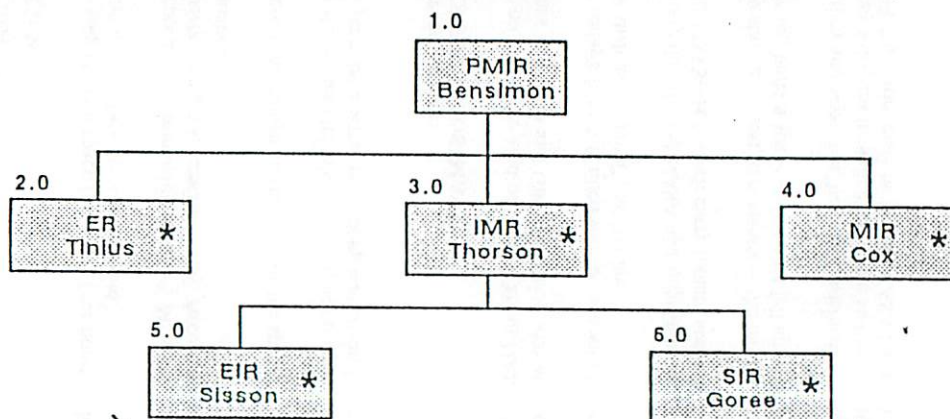
Technical Management Review and Panel Structure (Approved and Proposed)

before

FREEDOM



Technical
Management
Reviews



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Panels

Safety & Product Assurance 1.1 Lloyd	Comm Systems Engineer 1.3 Devirian *	Requirements 2.1 Duncan *	Assembly Seq. and Stage Del. 2.3 Bastedo *	Resource Allocation 2.5 Crammer *	Meteoroid & Orbital Debris 2.8 Huntsman	Integrated Logistics 4.2 Mars *	Ground Operations Integration 4.4 Mars *	System Design Integration 5.1 Rice *	Sys. Function & Performance Integration 6.3 McNeely *
System Safety 1.2 Griggs *	Networks Technical 1.4 West *	System Verification Requirements 2.2 Dellinger *	Redundancy Management 2.4 Sinclair *	Environ. 2.6 Brewer *	User Integration 4.1 Clark *	Mission Operations Integration 4.3 Lewis *	Element Design Integration 5.1 Kross *	System Integration Support 6.2 Meroer *	Avionics S/W and H/W Integration 6.4 Williams *

Sub-Panels

Quality Assurance 1.1.1 Austin	Reliability & Maintainability 1.1.2 Harkins	Software Product Assurance 1.1.3 Austin *	Assbly Planning & Stage Integ. 2.3.1 Walker *	Training Operations 4.3.1 Hughes	Mission Operations 4.3.2 Algate	SCADSI 4.3.3 Cole	Station Operations Technique 4.3.4 TBD
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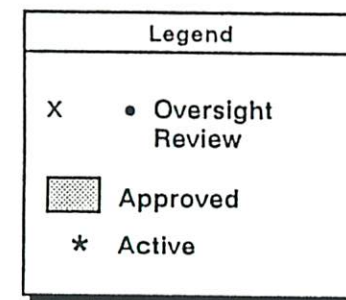
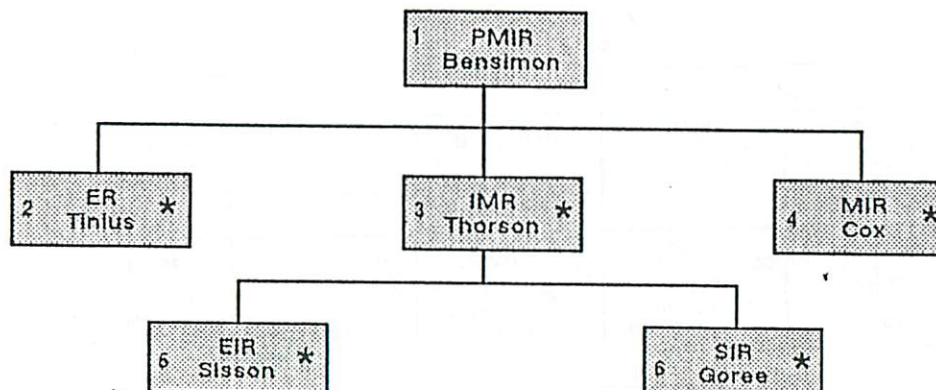


Technical Management Review and Panel Structure (Approved and Proposed)

after



Technical Management Reviews



Panels

Safety & Product Assurance 1 Lloyd	Assembly Req. and Stage Def. *	Meteoroid & Orbital Debris 2 Huntsman	Integrated Logistics & Ground Ops Integ. 4 Mars	System Design Integration 6 Rice
Redundancy Management 2 Sinclair	Environ. 2 Brewer	Mission Operations Integration 4 Lewis	Element Design Integration 6 Kross	Avionics S/W and H/W Integration 6 Williams

Sub-Panels

SCADSI 4 Cole	Station Operations Technique 4 TBD
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10/20

2/8



National Aeronautics and
Space Administration

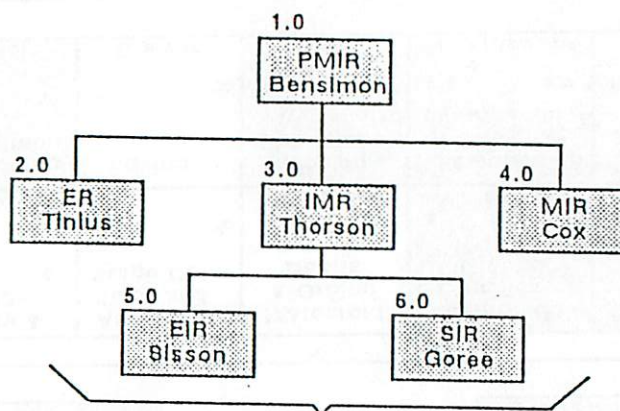
Technical Management Review and Working Group Structure (Proposed and Approved)

before

FREEDOM



Technical
Management
Reviews



Notes
All attached to PMIR
Approved
Active

APPROVED

Security & Privacy L. Perez	GSE R. Wickham *	Payload Integ. Center Certification C. Marglitz *	Gn. Ops. Multi Flow Assmbl J. Powers *	Payload Analytical Integ W. Ramage *
Robotics J. Parrish *	Inflight Maintenance G. Johnson *	Resupply/Return D. Koupash *	G & T M. Kapell * A. Bennett	User Operations B. Recla *

IN WORK

Particles & Gases L. Leger *	Materials & Processes R. Mize	Mech. Systems W. Schneider *	S/W Arch Requirements J. Rush *	OMS J. Chapman	EVA S. Porter *	Loads & Dynamics C. Larsen *	TCS R. Neuton *	Supportability M. Battaglia
Ionizing Radiation J. Watts	Electromagnetic Compatability M. Harris	Interface D. Thomas A. Bond S. Hinkal *	Sim Reqmts & Stds C. Lively *	DRM L. Norton	MS J. Lewis *	Util. Distr. Integr. G. Rysavy	GN & C P. Kramer *	
Natural Environment J. Anderson	Plasma D. Snyder	Flt Demo A. Accola	MSC/RMS C. Robinson MSS SE&I (CSA)	FMS S. Turner *	ECLSS R. Humpheries *	DMS R. Coblentz *	EPS J. Dunning *	



National Aeronautics and
Space Administration

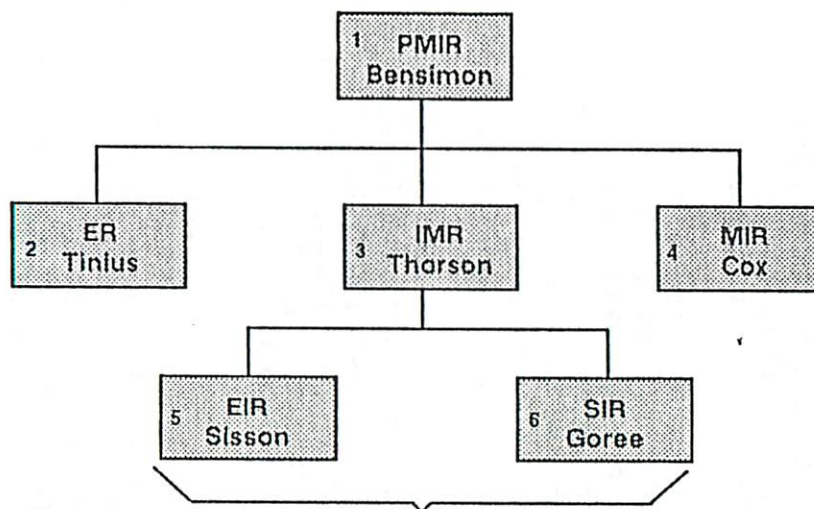
Technical Management Review and Working Group Structure (Proposed and Approved)

after

FREEDOM



Technical
Management
Reviews



Notes
All attached to PMIR
Approved
* Active

WORKING
GROUPS

GSE	Robotics	Inflight Maintenance	C & T
R. Wickham *	J. Parrish *	G. Johnson *	M. Kapell * A. Bennett / J.K.

Mech. Systems W. Schnelder *	EVA S. Porter *	Loads & Dynamics C.Larsen *	TCS R. Neuton *	Interface D. Thomas A. Bond S. Hinkal *	
MS J. Lewis *	GN & C P.Kramer *	FMS S. Turner *	ECLSS R. Humphorles *	DMS R. Coblentz *	EPS J. Dunning *

15/35

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM
311.3-383

November 2, 1990

TO: Distribution
FROM: ^{RWA} Bob Aster/Charles Ivie
SUBJECT: CSEP Trip Report

The Communications Systems Engineering Panel (CSEP) was on the list of panels canceled last week. A "Communications Systems Engineering Meeting" was held as scheduled on October 30-31. The exact role of JSO in systems engineering of SSF information systems is not well understood at this time, but specific tasks (eg., rework DPRD Section 7, submit a Virtual Channel change request, analyze performance of the SSF information system design, etc.) are intact.

C. Ivie arrived one day early to prepare a presentation on "Data Types Within the SSIS" (See attachment for vugraphs). The key message was that identification and definition of data types have important architectural implications, and that DPRD Section 7 will contain data type definitions that are consistent with the CCSDS "Blue Book".

Valuable insights were provided by Marc Toussaint, from the European Space Agency. He emphasized the need for an "end-to-end specification" of functional and performance requirements, which includes the foreign systems. He also described DMS benchmark results which indicate unexpected (up to 2,775 milliseconds) latencies within DMS, which is unacceptably large. Vugraphs are attached, additional material has been requested.

Virtual Channel recommendations were described by A. Webb, and additional work will be needed to bolster the case for 8 vs 3 VCs per NIU. R. Aster will be involved in this work for A. Webb.

A. Johnson (NASA Code MSU) expressed an interest in analysis support from our Communications Analysis Team. She is assembling an issues list which we could use as the basis for proposing additional work. C. Ivie developed this opportunity.

Attachments

Distribution: J. M. de Pitahaya, G. Deshpande, R. Staehle

cc.: R. O'Toole

Space Station Utilization Team Weekly Meeting Minutes
For additions or changes to this list, contact Randy Cassingham

Distribution	Sec	Mail Stop	Phone	NASAmail	TELEmail
Aster, Bob	311	601-237	4-1369		
Badilla, Gloria	521	301-456	249-5252		
Beck, Hank	120	Reston ✓	8-457-7648	Hank.Beck	
Beatty, Richard	120	Reston ✓	8-457-7592	RBeatty	
Bergstrom, Sheryl	374	JPL-Cape ✓	8-253-2161		
Borden, Chet	311	601-237	4-1238		CBorden
Brown, David	331	Code MU	8-453-1179	DHBrown	
Cassingham, Randy	311	601-237	4-1273	RCassingham	
Chen, Bing	355	67-201	4-5353	CPChen	
Coffin, Dick	317	301-280 ✓	4-3730	RCoffin	
Cutts, Jim	800	180-604	4-4120		
Deshpande, Govind	311	601-237	4-1279	GDeshpande	
Devirian, Mike	120	Reston	8-457-7209	MDevirian	
Doane, Jim	311	601-237	4-7996	JDoane	
Easter, Bob	120	Reston	8-457-7211	REaster	
Elachi, Charles	700	180-703	4-5673	CElachi	CElachi
Fitzhugh, H.L.	374	179-206	4-6906	HFitzhugh	HFitzhugh
Frederick, Suzanne	311	171-258 ✓	4-1181	SKFrederick	
Friesema, Stuart	HQ	Code MU	8-453-1184		
Gabriel, Steve	521	301-460	4-4952		
Garrett, Hank	521	301-456	4-2644		
Glavich, Tom	385	169-314 ✓	4-3952	TGlavich	
Glazer, Stu	HQ	Code SN	8-???-????		
Goranson, George	521	122-113	4-2809		
Gray, Bill	312	301-170U ✓	4-1090	BillGray	
Grumm, Richard	355	233-200	4-9267	RGrumm	
Handley, Tom	366	301-440 ✓	4-7009	THandley	THandley
Hansen, Bert	347	198-219 ✓	4-6092	BHansen	BHansen
Hartsough, Chris	367	301-350 ✓	4-1498	CHartsough	
Hendrickson, James	354	157-410	4-3458		
Henry, Paul	311	601-237	4-1257	PHenry	PHenry
Hixon, Dave	120	Reston	8-457-7220	DHixon	
Hooke, Adrian	317	301-235 ✓	4-3063	AHooke	
Horttor, Richard	339	161-228 ✓	4-2462	RHorttor	
Houseman, John	385	125-112	4-1601		
Hyde, James	120	Reston	8-457-7204	JHyde	
Ivie, Chuck	311	601-237	4-9090	Clvie	
Kehoe, Tom	120	Reston	8-457-7206	TKehoe	
Kelley, Jim	861	180-602	4-7068		
Kern, Dennis	521	301-456	4-3158		
Kern, Roger	355	89-2	4-2233		
Kleine, Henry	363	510-264 ✓	7-9690	HKleine	
Kossmann, William	120	Reston	8-457-7207		
Krauthamer, Stanley	342	303-300	4-7740		
Kuberry, Dick	521	301-460	4-8827		
LaBaw, Clayton	382	11-116	4-6248	CLaBaw	
Laeser, Dick	120	Reston	8-457-7200	RLaeser	
Laskin, Bob	343	198-326	4-5086	RALaskin	
Lattu, Kristan	374	179-206 ✓	4-2499	KLattu	
Lemmerman, Loren	790	233-200	?-????		
Levin, Dick	311	601-237	4-1253		
Lewis, Donald W.	797	183-801	4-0840		
Lisman, Sima	343	198-326	4-4022	SLisman	
Luchik, Tom	354	125-214	4-3165		
Lyu, Michael	522	125-233	4-9411		
Mahoney, Bill	328	169-327	4-6606	WAMahoney	
Mahoney, M.J.	383	168-327	4-5584	MJMahoney	
Martin, Benn	780	264-648 ✓	4-8263	Benn	NSCAT
Masline, Richard	366	301-440 ✓	4-4889	RMasline	
Mattingly, Richard	313	233-302 ✓	4-4605	RMattingly	

	Sec	Mall Stop	Phone	NASAmail	TELEmail
Maund, Don	311	2158 LaJolla Dr, Stockton, CA 95204		MHumfreville	
Merrill, Orin	120	Reston	8-457-7223		
Millard, Jerry	354	89-1	4-2898		
Muirhead, Brian	352	158-224	4-8179	BMuirhead	
Murphy, Gerald	521	301-460	4-4952		
Nishioka, Ken	381	168-227 ✓	4-7674		
Oleson, Gary	120	Reston	8-457-7590		
Pappano, Al	213	180-402	4-5007	APappano	APappano
Paul, Lori	311	601-237	4-1166	LPaul	
Petrasek, Irene	521	301-460	?-????		
Pomphrey, Rick	366	100-22 ✓	584-2964	RPomphrey	
Pravdo, Steve	381	168-222 ✓	4-3131	SPravdo	
Rayman, Marc	312	301-170K	4-2544	MRayman	
Reiz, Julie	640	512-110	7-7664		
Rosenberg, Leigh	311	601-237	4-1251	LRosenberg	
Schlue, John	521	301-466	4-7318		
Schober, Wayne	881	180-603	4-8581	WSchober	
Shao, Mike	385	169-214	4-7834		
Shishko, Bob	311	601-237	4-1282		
Smith, Jeff H.	311	601-237	4-1236	JHSmith	JHSmith
Smith, Jeff L.	311	601-237	4-1064	JLSmith	
Staehle, Rob	311	601-237	4-1176	RStaehle	
Steele, Laura	311	601-237	4-1284	LCrary	
Starsman, Ray	120	Reston	8-457-7226	RStarsman	
Tai, Wallace	317	301-235	4-7561		
Taylor, William	HQ	Code M-8 ✓	8-453-2961	WWTaylor	
Thomas, Valerie	521	301-466 ✓	4-7472	VCThomas	
Tsou, Peter	???	183-501	4-8094		
Urban, Mike	120	Reston ✓	8-457-7591	MUrban	
Varsi, Giulio	880	180-603	4-2992	Varsi	
Volkmer, Kent	311	171-258 ✓	4-1240	Volkmer	
Von Gronefeld, Peter	120	Reston	8-457-7649	PVonGronefeld	
Vuolo, Bob	120	Reston	8-457-7587	RVuolo	
Wada, Ben	354	157-507	4-3600		
Webb, Allan	120	Reston ✓	8-457-7589	AWebb	
White, Robert H.	784	233-200	4-6786	RHWhite	
Werntz, David	311	601-237	4-1270		
Wiener, Paul	310	301-230 ✓	4-5748		
Wright, Frank	740	180-335	4-5690	FWright	FWright
Zygielbaum, Art	750	180-701	4-3564	AZygielbaum	

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Total: 100 (73 paper, 27 NASAmail) * Printed 6 November 1990


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-621

12 November 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: Space Station Team Meeting Minutes for 12 November 1990

PRESENT: Rob Staehle, Randy Cassingham, Kristan Lattu, Irene Petrasek, Charles Ivie, Paul Henry

Next Meeting: 3 December 1990 at 10:30 in 301-169

Note: Due to travel and the Thanksgiving holiday, the next two meetings are canceled.

Rob Staehle

As reported in a special meeting called last week, JSO will be phased out during FY 91. This does **not** mean, however, that JPL is going out of the Space Station business. Space Station tasks funded by NASA will continue as before in Pasadena. JSO-funded tasks will not be immediately cut off; they will be reviewed on a case-by-case basis, and funding may continue through the end of the fiscal year. JSO deliverables will be supported through delivery in useful form. NASA sponsors may be approached to take over support for useful Pasadena-based tasks, but don't count on success -- all are hit by the cuts in the budget increase.

Revision C of the Communications and Tracking system ACD has been released by MDSSC. Bob Vuolo/JSO has a copy.

"Some" (38) Turbo/Boiler Updates to the PDRD have been released. Rob has a copy.

Ed Reeves/SM, the deputy director of the Flight Systems Division, has issued a memo outlining support of the Integrated System Preliminary Design Review (IS-PDR). It is reproduced here:

Recent Congressional FY 91 budget actions have seriously reduced our planned science support for the Space Station Freedom, forcing substantial cut backs [sic] in all areas. While the Office of Space Science and Applications (OSSA) plans to provide some funding augmentation to continue integrated utilization planning and to continue development of OSSA payloads for the manned base, nevertheless; the resultant funding will require a reordering of our activities and priorities in support of the Space Station Freedom Program (SSFP).

It is our intent, during FY 91, to concentrate primarily on the definition and planning for OSSA payload requirements and the interfacing of those requirements to the SSFP, at both Levels I and II, through support of the control board activities. We also will support fully your activities at Reston during the 90-day study on redefining the space station hardware elements. We will not, however, plan to play an active role in the support of the ISPDR process, except insofar as recommendations are brought forward to the Space Station Control Board (SSCB) at Reston. Our support of the multitude of boards, panels, working groups, etc., will also, of necessity, be substantially reduced. Our Science Utilization Management (SUM) offices at the NASA centers will align their support activities along these same lines. During this coming year, we will rely on your utilization office at Reston to represent user interests, including those of the U.S. science community, to the station program office.

We also intend to hold the development of external attached payloads in an active, but standby condition, until the capabilities of the SSFP to support the selected investigations are fully resolved.

Check Ivie, Henry Kleine and Bob Aster should review Mike Devirian's November 5th "CSO Schedule Update" memo and indicate to appropriate Reston personnel whether or not they can support the scheduled deliverables to which Pasadena personnel contribute.

Norm Reilly's task "Tool for Operations Modelling and Analysis in Space" (TOMAS) has been documented in a work package agreement, which will be forwarded to Reston tomorrow for approval.

An "In-space Technology Experiments Program" (IN-STEP) draft AO for FY 91 is planned for a December release to solicit flight experiments in the \$5 million (average) range for 10-12 Shuttle flight experiments. Some of the on-Lab Space Station tasks might find a good use for this program. Anyone interested in preparing a proposal should contact Jim Kelly.

Kristan Lattu

The SUM-DR budget planning meeting, scheduled for November 13-14, is by invitation only. No one at JPL received an invitation. Gary Wickes will report the results of the meeting at the SUM telecon on Thursday.

Irene Petrasek

Gerry Murphy reported by memo on his recent trip with Phil Leung to review electrical power system grounding and related documents.

Dana Brewer/MS will be taking Phil's grounding test plan to the Space Station Control Board and will get back to us on whether the plan can be implemented.

Gerry Murphy is working with Dick Williams and Kevin Schaeffer/MSU to define next year's level of effort.

Chuck Ivie

The FROST Flow Control study and Object Library coding is progressing on schedule.

JPL is free to characterize the ground system portion -- and possibly the space portion -- of the SSIS in terms that are technology- and implementation-free. That is, purely in terms of the functions that have to be provided, as defined in the PRD. Chuck is currently working on a white paper that addresses those issues. The whole idea of the POICs, POCCs, etc. are not essential to the description of the functionality of the SSIS, which Chuck sees as freedom to attack the job in an intelligent manner.

Paul Henry

Paul has been away on travel lately, including the Evolution Working Group meeting late last month. Mostly, the meeting was spent discussing concern over the Turbo Team's recommendations, and their impacts on various systems. Barry Meredith and Steve Cook/MT had a meeting with Richard Kohrs on September 24 on the Turbo impacts -- Kohrs suggested that there should be a joint Level I/Level II meeting to discuss these impacts. Apparently, Kohrs thinks pretty highly of the EWG, saying it "is maintaining the vision of the program". Ground control of robots was another topic, with KSC stating it was not feasible (which brought about half the attendees to their feet in protest); JPL will be submitting a proposal this month to LaRC to perform a cost/benefit tradeoff on this issue. Cate Heneghan/311 and Bob Shishko/311 presented an approach to telerobot control from the ground and related cost analysis.

No activity was reported for SDTM, MESSOC, or MCPF.

Upcoming Meetings

November 13-16: Integrated Systems Preliminary Design Review meeting in Reston. No one slated to attend.

November 16: Space Station Payload Safety Document meeting at HQ. Hershal Fitzhugh, Kristan Lattu and Dick Grumm will participate via telecon.

November 27-28: Mission Management Director's Review (MMDR) in Washington. Hershal Fitzhugh and Bob White to attend.

November 28-30: Space Station Science and Application Advisory Subcommittee (SSSAAS) meeting at GSFC. Bob White to attend.

December 4-6: OSSA Microgravity Science and Applications Division (MSAD) Intercenter Systems Engineering Team meeting at JSC. Emphasis will be on safety. Chuck Ivie and Dick Grumm to attend.

December 14: SUM Level III Data Base team here. Dick Grumm is primary meeting interface.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

Associated Press -- 11/8/90

"BACK TO STATION DRAWING BOARD" By Harry Rosenthal

"NASA is literally going back to the drawing board to live within its budget and still find a way to build a space station to put Americans into space permanently."

The story quotes space flight chief William Lenoir as saying "we have \$6 billion more program planned than we have money for. It is our intention to come back in 90 days with the answers to what can we do, what makes sense, and still have a useful, affordable program. If we cannot come up with what we consider a reasonable program then we would have to readdress whether we should even go forward with the space station."

The report says that the Bush administration had asked Congress to spend \$2.51 billion in 1991 to propel the \$37 billion space station into the hardware building phase, but lawmakers allocated only \$1.9 billion and told NASA to build the station in smaller steps -- each independent of the other.

The AP also reports that Congress told NASA to limit station expectations to no more than \$2.6 billion in any given fiscal year, thereby squashing the agency's plans for a ramp up to \$4 billion in 1996 funding expectations.

The wire service reports that Lenoir indicated station construction would begin in the spring of 1995 with the station ready for some form of occupancy by early 1996.

The reporter notes that a frequent criticism of NASA is that it is building a "Cadillac" instead of a "Chevrolet" and cites Lenoir as responding with a line from a Johnny Cash song which intones "maybe we are going to build a Cadillac one piece at a time."

Wall Street Journal -- 11/9/90

"NASA SPACE STATION OVERHAUL DRAWS CRITICISM" By Bob Davis

"The National Aeronautics and Space Administration's move to slim down its proposed \$37 billion space station is leading to calls to dismember the craft."

The paper quotes John Pike, space analyst at the Federation of American Scientists, as saying "this is 'The Picture of Dorian Gray.' The station is disintegrating before your eyes."

The Journal says that NASA on Wednesday indicated that it was planning to build a smaller version of the station because of budget cuts. The report says the smaller version would address issues mostly in the areas of biology and microgravity research.

The paper cites NASA officials and two outside experts in the rest of the story. The paper quotes one outside official as indicating that NASA should revisit the Industrial Space Facility proposed some time ago by Space Industries International. That expert -- John Pike, according to the paper, says the cost of the ISF versus the proposed station would seem to indicate a reexamination of the industrial facility.

The paper quotes J.R. Thompson, deputy director of NASA, as saying the agency is on record as indicating the ISF is a "dead end," and does not afford any growth potential as would the NASA-proposed station.

The paper also quotes John Logsdon, director of the space policy think tank at George Washington University, as suggesting NASA not spend any money on the ISF but rethink the agency's plans and build a NASA station on a smaller budget.

New York Times -- 11/9/90

"NASA STUDYING WAYS TO REDESIGN SPACE STATION" By Warren Leary

"At the urging of Congress, space agency officials say they have begun studying ways to redesign the space station Freedom that will probably result in a smaller orbiting station that will not be permanently occupied at first."

The Times reports that on Wednesday NASA officials indicated the agency was undertaking a study of how the station could be built and become useful while still under construction.

The paper reports that NASA hopes to be able to launch the first elements of the station on schedule in March 1995 but would stretch out the completion of the project until 2000.

The report quotes space flight chief William Lenoir as saying "the space station over the years has promised a lot of things to a lot of people. The phased approach will cut out our initial ability to do long-term life sciences experiments."

The story says that permanent habitation of the station is still NASA's goal but that the station project cannot now support everyone's expectations and will be scaled back to fit within a Congressionally defined cost structure.

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-625

3 December 1990

TO: Distribution

FROM: Randy Cassingham *RC*

SUBJECT: Space Station Team Meeting Minutes for 3 December 1990

PRESENT: Rob Staehle, Randy Cassingham, Bob Vuolo, Bob Aster, Hershal Fitzhugh, Govind Deshpande, Kristan Lattu, Henry Kleine, Charles Ivie, Paul Henry

Next Meeting: 10 December 1990 at 10:30 in 301-169

Rob Staehle

"Kudos" were passed along by Rob, based on unsolicited praise from sponsors for work well done: to Paul Henry from Remer Prince/MUU; to Chuck Ivie from Angie Johnson/MSU; and to Gerry Murphy from Al Holt/MSU and Dana Brewer/MSS.

Bob Moorehead has approved JSO's budget consistent with the planned "orderly close-out" of their activities. The first cuts of Reston-funded Pasadena personnel will occur approximately March 1. Many of these cuts may be compensated for by shifting task sponsorship from JSO to other sponsors.

Rob was at headquarters and Reston before Thanksgiving and met with various sponsors: Dick Laeser, Bob Easter, Mike Devirian, Bob Vuolo, Mark Bergam, Hank Beck, Richard Beatty [JSO]; Michael Hawes, Al Holt, Angie Johnson [MSU]; Dana Brewer, Kevin Schaeffer [MSS]; Earle Huckins, Steve Cooke [MT]; Remer Prince, Barry Epstein, Jack Collier [MUU]; Bob Benson, Phil Cressy, Mark Sistilli [SM]. All were quite positive about the work that we have been doing, and have been happy to hear that JPL/Pasadena will still actively support Space Station tasks. They have in general expressed a willingness to continue their support of our work. Most sponsors do not expect to understand their budgets until next (calendar) year. Task managers should continue to seek support; remind your sponsors of the value of our work to current high-priority concerns, and especially listen to the sponsor's needs. This especially includes: Paul Henry's work for MUU and MT, VAPEPS for MSS, Environments for MSU, CAT, and other JSO-sponsored tasks with potential new sponsors. One thing to note: many NASA civil servants don't really understand that at JPL, no charge number means no jobs for our personnel.

Rob also heard interest from various sponsors in having some of the displaced Reston personnel stay as detailees. Any inquiry of this sort should be referred to Dick Laeser.

Lennard Fisk/S and Katie Schmoll/S will be here Thursday and Friday on other business, but will be bringing some budget news for the Science Utilization Management activities. Code S's Space Station budget was cut from a requested \$15 million to about \$3 million. Bob Rhome expects a bit of a rebound in FY 92. Rob talked with Bob Rhome/S this morning, who confirmed continuing FY 91 support for JPL participation in OSSA's Science Utilization Management Team. He indicated that he values Kristan Lattu's involvement. Hershal Fitzhugh will officially replace Bob White as the JPL SUM team representative.

Barry Epstein/MUU is working with Paul Henry to define the tasks for Paul's continued utilization work. Remer Prince would like to expand JPL's support to his office, largely on the strength of Paul and Randy's performance on tasks for him.

Rob and Mike Devirian/JSO will coordinate discussions with Angie Johnson/MSU of the Communications Analysis Team and the RALPH-derived resource scheduling tools.

Henry Kleine and others need to revise their SRMs (and the deliverables in the WPAs) based on JSO's phase-out plan. If new funds come from new sponsors, they will be handled under new account numbers.

A review of all of JPL's Space Station work that relates to OSSI will be held here on Tuesday, January 8, starting at 8:30 am in 180-703b. The review was called by Jim Cutts/OSSI. Probable presenters include: **Hershal Fitzhugh, Kristan Lattu, Valerie Thomas, Wallace Tai, Dick Grumm, Peter Tsou, Paul Henry, Dennis Kern** (microgravity, high frequency issues), **Sima Lisman** or alternate (microgravity, low frequency), and **Bob Aster**. Also expected to attend are Frank Schutz, Paul Swanson, Ken Nishioka, and others from OSSI, plus anyone the presenters might care to invite. Emphasis will be placed on OSSA-funded tasks.

With the Station tending more toward a man-tended approach, Dick Grumm and Bob Aster might want to look more at issues relating to possibly increased opportunities for remote operations. The quality of microgravity may be improved when a crew is not present. Without a crew, remote operation from the ground takes on greater importance. Latency times may be reduced with a simplified information system, perhaps making remote control of experiments more feasible.

A formal stop work order on the Attached Payload Accommodations Equipment has been issued. Smaller attached payloads, such as those which may be accommodated by the JEM "back porch", may now have increased opportunities. Even simpler payloads, attached to the modules, may also gain favor.

The Space Station Advisory Committee met on November 13-14, with talk centering on the Station's restructuring. The Committee brought "several items to the attention of the Program for their consideration during the restructuring process", including: Systems verification prior to launch "is critical to the success of the orbital assembly process"; "The emphasis on man-tended experimentation prior to achieving (PMC) offers an additional opportunity to conduct exploratory microgravity research in an environment not disturbed by the presence of people in the periods between assembly activities"; "The restructuring period would be a good time to come to some conclusions regarding the role of robotic/teleoperated devices in SSF assembly and maintenance"; "The view of the Committee is that the initial design of SSF did not put sufficient emphasis on achieving commonality of components and subsystems across the total station. One example is television cameras, where 3 separate systems are being developed"; "The restructuring guidance states that life sciences and microgravity research are paramount. We are persuaded that the long term usefulness of the Station as an institution for conducting research and development activities would be enhanced by the involvement of the user community outside NASA in reestablishing the requirements for experiment accommodations."

Lennard Fisk, AA for OSSA, issued a memo to Lenoir (AA for Space Flight) outlining OSSA's requirements for Shuttle launches from 1995 through 2000. Excerpts include: "Separate from any station activity... the OSSA requirement is for approximately two equivalent dedicated Shuttle missions each year.... We had originally planned to continue (several Spacelab flights). Given the availability of Space Station Freedom (SSF), I would divert these, and possibly some flight opportunities other than those cited above, in order to achieve three space station utilization flights per year for OSSA prior to a permanently manned station.... These OSSA science utilization flights are considered to be equivalent dedicated missions and would be in addition to any similar requirements from other codes or agencies, and also in addition to the above mentioned ongoing OSSA shuttle program. The Shuttle-based missions will require continued access to the current ground integration facilities at (KSC) and to the (POCC) facilities at (MSFC) and (JSC). Thus, these ground based facilities must remain available with their current capabilities and interfaces for the foreseeable future.... In addition to the above missions, there will be the need for the launch of OSSA free-flying spacecraft that will be ready for deployment during this period", including AXAF and several Hubble revisits.

Rob has a memo from Margaret Finarelli/X regarding the United States' technology policy, as formulated by the President's Office of Science and Technology Policy. The goal of the policy is "to make the best use of technology in achieving the national goals of improved quality of life for all Americans, continued economic growth, and national security." Anyone wishing a copy of the policy should contact Rob.

The 1991 NASA/ASII Summer Faculty Fellow Program has been announced, awarding 26 fellowships to university faculty members to work on NASA-related projects at JPL/Caltech. The emphasis will be on faculty who might otherwise have little exposure to NASA and JPL. Repeat applicants (i.e., from previous years) are discouraged. Anyone interested in this program should contact Harry Ashkenas. The application deadline is February 1.

Rob asked for a volunteer to review a paper submitted to the Journal of the British Interplanetary Society titled "The Commercial Demand for Space Stations". Govind Deshpande volunteered.

Rob received from Dennis Kern/521 a copy of his November 6 presentation, "VAPEPS Estimate of Space Station Interior Noise Due to Fans" given at the Loads and Dynamics Working Group meeting. He notes that in the US Lab, this first analysis suggests that as much as 30 db of acoustic attenuation is required in some spectral ranges to meet the desired NC-50 background noise standard. This would be very difficult.

Bob Vuolo

Bob is here from Reston to meet with several people. He notes that JSO's Communications Systems Office is currently working on four big issues:

- The Integrated Systems PDR, for which there are about 5000 RIDs;
- Restructuring of the Station, which is well under way and expected to continue to the end of January. Many new designs have been proposed;
- Rework of Section 7 of the PDRD;
- Work on communications issues for Angie Johnson/MSU.

The cut-off date for RIDs on the IS-PDR is December 14. The next week, the Space Station Control Board will meet.

Bob Aster

The Communications Analysis Team has released their study report, "Analysis of NIU Bandwidths". The next study, "Analysis of Flow Control", is in draft form and will be issued soon. In the meantime, Bob is working on replanning the JSO-sponsored work over the next four months of phase-out and transferring Pasadena tasks to a new sponsor.

Henry Kleine

The manpower issue is settling down. Felicia Sanders is out of the picture, but Henry expects that Joe Younger may be back by the end of the month. In the meantime, development is limited. Henry is also working on setting up new funding sources for internal JPL spinoffs of the Freedom Operations Simulation Test model.

Kristan Lattu

The visit of Carole MacLemore/MSFC to JPL and other Centers to gather information on OSSA requirements for the Data Management System is canceled. The trips may be rescheduled for January or February.

Hershal Fitzhugh

Fitz attended the Space Station Science and Applications Advisory Subcommittee meeting last week for Bob White (who attended the simultaneous Mission Management Director's Review (MMDR) meeting). Fitz concentrated on the attached payload sessions; the general opinion of the scientists there is that they want to be sure that some sort of attached payload accommodations be available as an option. Japan and ESA both mentioned that they are looking at ways to cut costs, with Japan threatening to cut the size of the JEM's "back porch". On the pressurized side, the biggest issue was the level of pressurization: 14.7 psi ("sea level") or 10.2, which would reduce requirements for pre-EVA setup and reduce some of the Station's structural requirements.

At the Spacelab MMDR, Bob White noted that Michael Lou/354 and Chuck Lifer/354 talked about safety of Station structure and design. Bob has Harry Kraft/MSFC coming to JPL in January or February to talk about mission management problems with our experimenter developers.

Gerry Murphy

Gerry and Phil Leung are working on the Grounding Effects Tiger Team, which met recently at LeRC. The Team is studying three major effects: sputtering, arcing, and contamination (mostly from sputtering and arcing). The Team has participation from JPL, GSFC, LeRC, MSFC, Grumman, and others. JPL will support arcing tests in our test chamber, according to a broad plan of tests at various facilities available soon. The plan was prepared by Dana Brewer/MSS at the request of Bob Moorehead/MS. She will turn to him soon to request funding to carry out all the tasks, including those at JPL. Carl Maag, formerly of JPL, is now working for SAIC, assigned to Grumman SSEIC tasks. Kristan asked whether others in Division 35 should be consulted about these tasks.

Code MSU has allowed that the carryover from their environmental monitoring tasks be redirected to general support for MSU-related work.

Paul Henry

Paul and Jeff H. Smith are working on a proposal for a task to examine the feasibility of ground-directed robotic maintenance and servicing for Code MT.

Paul is working with Barry Epstein/MUU to work out task plans to work on Level I utilization issues.

Chuck Ivie

Chuck has a copy of Revision C of the PRD; it is significantly updated. Rob will provide Chuck with information system-related info from the Spacelab Payload Accommodations Handbook (SPAHL). It may be helpful for interpreting implications of Bob Moorehead's directive to "Shuttle-ize" the Space Station's communications and information systems. Chuck pointed out two big differences between Shuttle and Space-Station information system operating assumptions: 1) the Shuttle system is not designed to operate continuously for months on end; and 2) there are no provisions for routine change of operating hardware or software during flights aboard the Shuttle. Refitting to meet these requirements may be extremely difficult.

No activity was reported for SDTM, MESSOC, or MCPF.

Upcoming Meetings

December 4-6: OSSA Microgravity Science and Applications Division (MSAD) Intercenter Systems Engineering Team meeting at JSC. Emphasis will be on safety. Dick Grumm to attend.

Cancelled: SUM Level III Data Base team here. Dick Grumm is primary meeting interface. May be rescheduled for January or February.

January 7: AIAA meeting in Reno (paper on Space Station Environmental Effects to be presented).

Hank Garrett and Gerry Murphy to attend.

January 8: Review of all OSSA-related Space Station work that relates to OSSI in room 180-703b.

January 15-16: User Operations Working Group meeting in Huntsville. Hershel Fitzhugh to attend.

January TBD: Space Station Grounding Tiger Team meeting in Reston. Phil Leung and Gerry Murphy to attend.

May TBD: Second Evolution Symposium: "Beyond the Baseline '91" at the South Shore Harbour in League City. No one yet slated to attend.

Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

The Philadelphia Inquirer

"JAPANESE TV REPORTER HEADED FOR SPACE By Kathy Sawyer

"A Japanese television reporter is poised to become the first journalist in space, a privilege for which his employer has paid the Soviet Union at least \$11 million."

A December 2nd, eight day mission to the Soviet Space Station Mir will carry Toyohiro Akiyama, the former Washington bureau chief for the Tokyo Broadcasting System (TBS) and its current deputy news director, according to the report.

In need of hard currency, the Soviets have aggressively marketed their unique manned spaceflight capabilities as well as other space services, says Sawyer's piece.

The story continues, detailing the Soviet guest astronaut program, and a possible U.S./USSR swap in which a U.S. astronaut would fly aboard Mir and a Soviet cosmonaut would fly aboard a shuttle as early as 1992.

Akiyama will broadcast reports from the station and conduct photography and medical experiments with frogs.

The story reports that the flight is seen as a possible precursor to a TBS press bureau aboard the U.S. space station Freedom with a space reporter assigned on a continuing basis, according to TBS.


JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

311.4-629

10 December 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: Space Station Team Meeting Minutes for 10 December 1990

PRESENT: Rob Staehle, Randy Cassingham, Kristan Lattu, Henry Kleine, Bob Aster, Dennis Kern, Paul Henry, Richard Grumm, Charles Ivie

Next Meeting: 17 December 1990 at 10:30 in 301-169

Rob Staehle

The Augustine Commission has recommended that NASA consider modelling the management of its centers on JPL as a possible alternative to civil service reform. The Commission noted that under our system, a person can be *fired* as well as hired, and that salaries are more competitive than those in government. Vice President Quayle specifically cited the JPL/Caltech model in his introduction to the Commission's press conference this morning.

Bob Easter and Dick Laeser were here last week to discuss "resettlement" of the JSO/Reston people back into JPL Pasadena.

Level II held a management review in Reston October 18-19. Items of note from the minutes, dated November 28: "The management group discussed ways to improve communications and to adhere to an 'open society' principle. [These fundamental principles include that the management team:] ... should ensure a program perspective [and] be willing to stake their career on their recommendation." The report noted that there is a "need for quality and better preparation of CRs.... [P]roblems include late inputs from reviewers ...[and] incomplete representation of opposing viewpoints." Regarding panels and working groups, "It was made clear that people (individuals) are accountable for results, not groups." Of the role of the Space Station Engineering and Integration Contractor (SSEIC), it was noted that "SSEIC is accountable for overall integration; however, existing work will be leveraged, not duplicated. SSEIC is accountable for ensuring that all necessary work is completed.... SSEIC is in partnership with [the] full NASA team (including contractors).... It's important to recognize that the SSEIC role in no way dilutes or diminishes the NASA Level II responsibility."

Robert Rhome/S has agreed to continue funding JPL's Science Utilization Management team support. We were expecting funding to be cut to zero this year.

Rob called attention to Pete Lyman's November 28 memo regarding the reactivation of the Procurement Integrity Law. The law applies to JPLers when he or she "acts as an evaluator, expert, consultant, or advisor, or prepares specifications or statements of work, for a Federal agency procurement". In the past, JPLers have been asked to do this kind of work on Space Station tasks, though Rob knows of no such work now in progress. JPL employees may want to carefully consider whether or not they wish to participate in such work.

The 1991 AAS/AIAA Astrodynamics conference will be held September 19-22 in Durango, Colorado. The deadline for abstracts is February 15.

Rob notes that the SSORCE Forum Series of talks on Galileo is very interesting and useful; he encourages people to attend. The next will be on the Command and Data Subsystem, and will be held this Thursday at 12:05 in von Karman.

Kristan Lattu

A Lab Support Equipment telecon will be held at 10:00 on December 18 to discuss the optical microscope system, which is part of the lab "workbench". She will cover it. The scanning electron microscope is not part of this system. It currently is still part of the suite of LSE.

Bob Aster

Bob Vuolo/JSO was here last week to discuss several items, most notably the possibility of new sponsors for FROST. For this effort, Bob is setting up a meeting with Angie Johnson/MSU next week; Bob, Chuck Ivie, and possibly Dave Wernitz (to represent the Freedom Assembly Sequencing Team) will attend this meeting. Another possible funding source is Pete Williams/MSS, who Chuck knows, who is putting together a list of issues, some of which we may be able to support.

Bob is also working with Chuck on the "Shuttle-ization" of the Station's data management system. See Chuck Ivie's entry below for more details on this. They are aiming to present a conceptual end-to-end architecture, using a Shuttle-based infrastructure and components, to the Communication System Engineering Panel meeting in January. From there, they plan simulation modelling, leading to performance assessments of architecture options by April 1.

Henry Kleine is working on a concept paper for SNAP -- the Static Network Analysis Preview -- which will represent a new capability for FROST. It should be finished by the end of the week.

Dennis Kern

Dennis has completed preliminary modelling of the acoustic environment from the ventilation system in the Habitation module with VAPEPS. The sound levels of the ventilation fans (before attenuation/damping) are 30 db above the daytime level criteria, and about 40 db above the nighttime criteria. This is very significant; it will be difficult to meet the criteria since porous materials cannot generally be used in the module (because they cannot be cleaned on orbit). The sponsor, Phil Bogert/MSS, has expressed an interest in continuing support of the work -- the Station is currently relying totally on VAPEPS for microgravity studies above 15 Hz. Dennis will write up a short white paper for Rob on the problem to increase visibility of the task.

Paul Henry

Paul delivered the last of the various Code MU Utilization Plans to Remer Prince/MUU last week. The plans cover FY93-95 -- including the timespan of the Station's First Element Launch. Putting schedules into the MacProject software format, at the sponsor's request, delayed delivery by two weeks.

Paul and Jeff H. Smith will finish their draft proposal for a task to examine the feasibility of ground-directed robotic maintenance and servicing for Code MT this week. Dick Grumm also has high interest in remote operation of experiments, especially with indications of longer periods of higher-quality microgravity made possible with man-tended -- as opposed to permanently manned -- operation.

Dick Grumm

Dick was at the Lunar and Planetary Institute in Houston last week for the 8th Code SN Intercenter System Engineering Team (ISET) meeting. Dick was accompanied by a representative of the JPL safety office for a one day set aside to discuss safety issues, and that portion was very interesting. Bonnie Dunbar, an astronaut, ran the session. She said again that payload developers are over-reacting to safety requirements and spending more money than required to meet safety specifications. She brought along the STS Safety Panel to unofficially evaluate safety concerns. One of the issues raised is that different safety standards (and different documents) will be used for STS and the Station; a big problem might result if a payload passes the STS review, then goes to the Station review, which orders a change to the payload. The payload must then go through the STS safety process because a change was made. Then, perhaps, the STS panel would require a change

to the changed payload, resulting in an endless loop for the payload developer. It was noted that even if STS and Station safety requirements were identical, the differing *documentation* requirements would result in about a \$1 million *per payload* expenditure for the duplicate safety process. Even a payload that has already flown on STS/Spacelab could not fly on the Station without going through the separate Station safety review.

Dick noted also that if Station safety requirements and procedures were adopted from STS with minimum necessary modifications, there would be a large body of "case experience" for users and others to use in interpreting how to implement safety requirements. Station safety people appear to be asserting their independence, and show little desire to base their approach on that used for the Shuttle, even though hardware which rides to the Station on the Shuttle will also need to meet Shuttle requirements.

Another issue discussed at ISET is that the "no venting allowed" requirements are contained in the *safety* documentation, which certainly is not the correct place for such requirements. Also, Dick has complained for some time that there is no standard requirements tracking tool. Ascent Logic, an outside vendor, demonstrated a tracking product (RDD -- Requirements-Driven Development) at the meeting that is in use at Grumman and in extensive use at Boeing, and may be in use elsewhere in the Space Station Program (this was unclear). Not having gotten a return call from Bob Glass/JSO, Dick will call Ray Starsman/JSO to see how RDD may compare with the ARTS program in use by JSO. Kristan Lattu noted that JPL uses an internally developed program called TRACER, which Randy happens to have information on; he'll send a copy to Dick.

During a discussion on where to have the next ISET meeting (it's southern California's turn), MSFC payload people said they wanted the meeting to be in Huntsville so that the MSFC SUM team people would participate. At MSFC and JSC, there is little apparent contact between the respective SUM teams and their center's payload people.

One interesting note: when someone left the meeting early one day, Dick asked him why. It turned out that the person had to go to a camera store to buy a camcorder for his Shuttle payload. Apparently, off-the-shelf camcorders are "much" better than the standard Shuttle cameras -- higher resolution, better color (and, of course, cheaper). The Shuttle cameras tend to be either black and white, or use color wheels and vidicon tubes for color images -- "1950s technology", according to Chuck Ivie. Standard camcorders have been used on several Shuttle missions. The only unusual requirement is that they be secured by 20 g tethers during launch so they can't flail around during an emergency. Dick pointed out that, as a result of this and other similar purchases, there is now a reasonable process at JSC for getting commercial hardware qualified for flight aboard the Shuttle. It does not appear that this process applies for Spacelab, the hardware for which must be certified at MSFC.

Chuck Ivie

Chuck is working on a methodology for working on the "Shuttle-ization" of the Space Station's DMS. This is an effort to reduce costs by emulating the Shuttle's DMS until PMC, when the full-up DMS would be implemented. Chuck's plan is to create a conceptual, "technology-free" architecture expressed in terms of needed functions and behavioral requirements that can represent the system during four different timespans which can be analyzed using FROST: FEL to MTC, MTC to PMC, PMC to AC, and post-AC. Chuck then plans to prepare a strawman architecture using Shuttle-based components for one of these time spans, which can then be discussed in an object-oriented representation for modelling and end-to-end behavioral and performance simulations by the CAT. This portion of Chuck's work is to be completed by the January 25 CSEP meeting. Description and modelling of architectures for other time spans will be complete by April 1, when JSO support ends. Chuck noted that the on-orbit transitions between the phases is probably a greater problem than has been realized. The Shuttle DMS has never been (and was not designed to be) changed on orbit. And the on-orbit transition between a "Shuttle-ized" DMS and the assembly complete non-Shuttle system might be too large a problem to surmount.

No activity was reported for SDTM, MESSOC, EMI/EMC or FAST.

Upcoming Meetings

January 7: AIAA meeting in Reno (paper on Space Station Environmental Effects to be presented).
Hank Garrett and Gerry Murphy to attend.

January 10 (new date): Review of all OSSA-related Space Station work that relates to OSSI in room 180-703b, 3:00-4:45 pm.

January 15-16: User Operations Working Group meeting in Huntsville. Hershal Fitzhugh to attend.

January 25: Communication System Engineering Panel (CSEP) meeting in Reston. Bob Aster and Chuck Ivie to attend.

January TBD: Space Station Grounding Tiger Team meeting in Reston. Phil Leung and Gerry Murphy to attend.

May TBD: Second Evolution Symposium: "Beyond the Baseline '91" at the South Shore Harbour in League City. Paul Henry and Jeff H. Smith to attend.


Recent Space Station-related items from Code P's "Daily News in Brief" (Typos not corrected...)

no relevant items this week

311.4-632

18 December 1990

TO: Distribution

FROM: Randy Cassingham 

SUBJECT: Space Station Team Meeting Minutes for 17 December 1990

PRESENT: Rob Staehle, Kristan Lattu, Henry Kleine, Bob Aster, Dennis Kern, Paul Henry, Richard Grumm, Charles Ivie

Next Meeting: 7 January 1991 at 10:30 in 301-169

Rob Staehle

Another GAO audit has been started, this one on "Information Technology for Space Station Freedom". The Pasadena GAO representative is not involved, but the audit has been announced internally by Marthella Greene/CMO. Anyone who is contacted by auditors should please notify Rob and Marthella Greene, and follow the procedures documented in earlier memos.

Gloria Badilla, Thomas Bergen and Terry Scharton are submitting an abstract titled "Using VAPEPS for Noise and Vibration Control on Space Station" to the 21st annual International Conference on Environmental Systems, being held July 8-11, 1991 in San Francisco. VAPEPS, of course, is the Vibroacoustic Payload Environment Prediction System.

The Spacelab to Space Station transition study interim report #2, "Transition of Drop Physics Module 3 to Space Station Freedom", has been issued by Ron Lewis. Done for Code SN, the executive summary states, in part, "It is expected that the reliability of the payload experiments are unacceptably compromised by the use of adapters of the type recommended by the SUM/MDAC study. Methods which are more reliable, less expensive, and require less SSF resources of power, weight, and volume are described and recommended." Dick Grumm, Stan Krauthamer and Wallace Tai helped with the study.

The OSSA traffic model for the Station restructuring has been sent by Bob Rhome to Dick Kohrs. Copies are available from Rob.

The following people should be prepared to do presentations at the January 10th OSS review: Rob Staehle, ~15 minutes; Hershal Fitzhugh/Kristan Lattu/Bob White, 40 minutes; Dick Grumm, 15 minutes; Peter Tsou, 10 minutes; and Paul Henry, 15 minutes.

Rob, Bob Aster, Henry Kleine and Dave Werntz are meeting tomorrow with various MSU and MSS people regarding JPL system analysis tools -- CAT/FROST [Communications Analysis Team/Freedom Operations Simulation Testbed], RALPH-based tools [Resource ALlocation and Planning Helper] (such as FAST [Freedom Assembly Sequencing Test]), SDTM [Station Design Tradeoff Model], MESSOC [Method for Estimating Space Station Operations Costs], etc.

CTA space operators database analysis system -- SODA.

Rob has received a paper from Bob Edelson which may be of interest: "Organization Aspects of Engineering System Safety". While written about the offshore platform industry, it cites management failures, and possible preventative steps, applicable to many large engineering projects. Copies are available from Rob.

Everyone have a good holiday. The next meeting will be held on January 7.

Dick Grunm

Dick met with salesmen regarding RDD (Requirements-Driven Development), a computer-based requirements tracking tool that was demonstrated at the recent ISET meeting. If there is enough interest, Dick will set up a demonstration at JPL.

Bob Peterson and Gene Trinh will be presenting a paper on microgravity experiments at the January AIAA meeting in Reno.

Hershal Fitzhugh

Fitz reported on OSSA's response to the Space Station restructuring, documented in a report received with Lennard Fisk's (Code S) signature.

Last week, Fitz participated in the MMDR review of "Rack Lessons Learned", presented by MDSSC. Bob Benson/SM asked if any "real" experimenters had even seen the report to review it -- none had. Fitz got two days to review and prepare a response. Dick Marmon of the MSFC Spacelab Program Office will present the revised report to Code M.

Gerry Murphy

Bob Glass asked Neil Devine/521, our resident micrometeoroid and orbital debris (MM/OD) expert, to review a change request specifying reliability of critical hardware in terms of MM/OD threats. This document is next up from last one in 30000 series. 521 was involved in 1988, mostly in reviewing the Kessler/JSC MM/OD model. Gerry would prefer we didn't get involved with this philosophical discussion of "acceptable risk" unless we're ready for a fight. Current requirement levels are absurd -- they could easily lead to excessive costs. If the Program wants an objective look, JPL is good at it, but it is not apparent that they want an objective response.

At the January 7-9 AIAA meeting in Reno, Gerry and Hank Garrett were to present a paper, but now, Gerry isn't sure it will be relevant because it was concerning external contamination and the attached payload environment. Instead of the paper, Gerry is getting people from MSFC, LeRC, JSC and others together for a panel discussion on Space Station grounding. This topic is timely to a major ongoing technical debate in the Program, whether or not there are attached payloads.

Kristan Lattu

Kristan recently reviewed four lessons learned documents: 1) Laura Crary's (Steele) Space Shuttle paper, 2) Training Lessons Learned, 3) Lessons Learned from Spacelab 1 (by Harry Craft/MSFC), and 4) DFVLR Spacelab D-1 and D-2 documents. Kristan noted how easily and smoothly rack integration went for the Germans, where the whole rack was integrated in Europe and then shipped to KSC. This is counter to JPL experiences, perhaps because the Germans had the racks there for integration, whereas JPL had to have rack integration done at KSC. Fitz reported that opposition is still strong by KSC, MSFC and HQ to provide JPL and other experiment centers with flight racks into which to integrate their flight experiments.

MDSSC/MSFC's assumption of lessons learned "don't ship around" -- apparently wasn't based on the smoother German results, and may be based more on heresay. They conclude elsewhere that they need more robust racks and rack handling equipment. Kristan pointed out that if they had more robust racks for other reasons, this would make the racks less likely to be damaged, reducing an often-expressed (but not necessarily substantiated) concern for sending racks to the experiment centers.

Kristan supported the December 18 Lab Support Equipment telecon; it centered mainly on optical microscopes and the glovebox.

No activity was reported for SDTM, MESSOC, FAST, Utilization Planning, CAT or FROST development.

Upcoming Meetings

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Recent Space Station-related items from Code P's "Daily News in Brief" (Typos *not* corrected...)

Washington Times -- 12/11/90

"NASA TOLD TO SHAPE UP" By Joyce Price

"The National Aeronautics and Space Administration must scale back its planned \$37 billion space station, phase out the space shuttle, start a new launch system, focus on science and learn to live within its means, a White House panel said yesterday."

The paper remarks that the panel noted "considerable criticism" which has been directed at the space agency because of such snafus as shuttle hydrogen leaks and Hubble telescope mirror aberrations and says the report states that "some of the concern is deserved and occasionally even self inflicted."

The story says the panel briefed Vice President Dan Quayle and NASA Administrator Richard Truly prior to publicly releasing its report and quotes panel chairman Norman Augustine as saying "NASA is neither as troubled as some suggest nor as good as it will have to be to carry out the program we have recommended."

The story also quotes the Vice President as saying the report "clearly points out the need for fundamental changes in our civil space program. We will make changes."

The paper says the report found that NASA was trying to do too much and allowing too little margin for the unexpected. The story says the panel recommended that NASA not develop another shuttle following delivery of Endeavour, but rather spend that sum on the development of advanced launch systems including the development of a new rocket engine.

The Times reports that the panel did offer support of a manned mission to Mars, but that it recommended such a mission be timed to the availability of funds rather than to a calendar.

The newspaper also cites various outside space experts including John Pike, American Federation of Scientists, Jerry Grey, American Institute of Aeronautics and Astronautics, and John Logsdon, George Washington University, all of whom the paper says were in general agreement with the Augustine panel's recommendations.

Space Fax Daily -- 12/11/90

"POLAND INTENDS TO JOIN EUROPEAN SPACE AGENCY"

"Poland has taken initial steps towards becoming the 14th member of the 13-nation European Space Agency which up to now does not include any Eastern European countries."

Space Fax Daily says an ESA delegation, headed by Roger Bonnet, visited Warsaw late last month and agreed to Poland's participation in joint ground station use and other joint activities prior to Polish membership.

Space Fax Daily -- 12/11/90

"SPACE COMMERCE CORP. SIGNS DEAL TO SEND FIRST AMERICAN COSMONAUT TO MIR"

"The nation's sole marketer of Soviet space goods and services, Space Commerce Corp., has just inked a letter of intent with the Soviet NPO Energia manned space activities program to take a private American citizen to the Mir space station in late 1992 or early in 1993."

The newsletter quotes Space Commerce president Art Dula as saying "it's done, it's signed, it's all finished as far as the paper work goes. I can tell you that it's a completely commercial proposition. We are simply paying for a ride to the Mir."

The report says that Dula could not reveal the name of the firm but did indicate that the firm had not yet picked the individual who would make the space trip.

Associated Press -- 12/12/90

"MORE FOREIGN COSMONAUTS"

"An Austrian cosmonaut will be launched into space next Oct. 2 in a continuing series of commercial flights, the Tass news agency said Wednesday."

AP's Moscow bureau reports that the announcement of the date for the Austrian flight came two days after the return of a Japanese TV journalist who had been on an eight day visit to the Soviet space station.

The story says the Austrian cosmonauts training for the flight are Cleens Lothaller and Franz Vienboeck. The report says one will be chosen to fly and the other will remain in training as a backup cosmonaut.

The wire service also reports that a British cosmonaut has been training for a flight slated for May but says there have been financing problems with that individual.

The report says that West Germany has signed up for a flight, as have the French and says that both Spain and South Korea have indicated strong interest in flying individuals from their country.
